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ON
RHEUMATISM,
RHEUMATIC GOUT, AND SCIATICA.

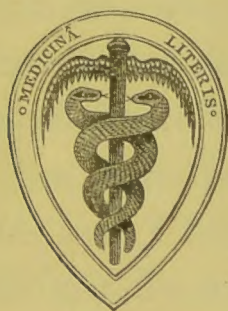
"RHEUMATISMUS SI MINUS PERITE TRACTETUR, NON AD
MENSES TANTUM, SED AD ANNOS ETIAM ALIQUOT, IMMO PER
OMNEM ADEQ VITAM, MISERUM HAUD INFREQUENTER DIS-
CRUCIAT."

Sydenhami Opera, Cap. V, sect. vi.

ON
RHEUMATISM,
RHEUMATIC GOUT, AND SCIATICA,
THEIR
PATHOLOGY, SYMPTOMS, AND TREATMENT.

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PREFACE

TO THE

THIRD EDITION.

THE demand which has arisen for a Third Edition of this Treatise, induces me to hope that my researches into the nature of Rheumatism and Rheumatic Gout, and my efforts to introduce a successful method of treatment have not been wholly unavailing. Encouraged by this feeling, I have endeavoured to render the work as complete and useful as possible, by bestowing more than ordinary care on its revision, by adding many practical suggestions, and by carefully recording the result of my experience as to the action of remedies which have been recently introduced.

The time which has elapsed since I first broached my opinions on the subject of Acute Rheumatism has enabled me to estimate at its true value the method of treatment which I then proposed; and I have much satisfaction in being enabled to affirm that the statements formerly made as to its efficacy have been more than verified. It subdues the pain and inflammation within a few days, and if vigorously carried out, completely protects the heart from mischief.

My views as to the nature of Rheumatic Gout, and its entire independence of Gout and Rheumatism, have received confirmation from the published researches of Adams, Garrod, and others, and it only remains for me to state that extended observation has led me to believe that, if properly managed, this disease is far less obstinate and formidable than it has appeared to be under the ordinary methods of treatment.

On the subject of Chronic Rheumatism, much still remains to be ascertained; for I am satisfied that many maladies are included under that comprehensive title which have nothing more in common than have smallpox and chicken-pox. I have endeavoured, however, as far as possible, to separate the different varieties, and to point out the remedies to which each is most amenable.

In the chapter on Sciatica and Neuralgic Rheumatism, I have given the result of my experience as to the effect of injecting morphia into the cellular tissue, and have also specified the conditions under which galvanism, electricity, and other remedies, prove useful. I have also appended a few cases illustrative of the treatment recommended.

My friends have urged me to add a chapter on Gout, as being an important member of the family of diseases comprehended in the scope of the present inquiry. But it would add so greatly to the bulk of this book, that I have determined to reserve my remarks on the subject for a separate volume.

13, MANCHESTER SQUARE;
March, 1860.

PREFACE

TO THE

FIRST EDITION.

ABOVE two thousand years ago, Hippocrates laid down the maxim, that all theories should be framed *κατὰ φύσιν θεωρίων*. From that time to the present, this maxim has prevailed in many departments of medical science; but in the investigation of rheumatism it has been too often neglected. Cold, and inflammation consequent thereon, have been regarded as the beginning and end of the disease; and any facts militating against this doctrine, have been heedlessly passed by or pronounced of little moment. So that, in the words of Professor Whewell, “the subjects of attention have not been external objects, but speculations previously delivered; the object has not been to interpret nature, but man’s mind; the opinions of the masters are the facts which the disciples have endeavoured to reduce to unity, or to follow into consequences.”¹

¹ Whewell’s ‘Inductive Sciences,’ vol. i, p. 18.

With the view of avoiding this source of error, I had proposed to myself to commence the present Treatise by a faithful record of all that has been ascertained of the history of rheumatism; and by reference to the facts thus proved and established, to show how conflicting opinions may be reconciled, and the pathology and treatment of the disease elucidated. The reader would thus have been impressed at the outset with many of those striking facts which serve as exponents of the true nature of the disorder, and would have been enabled to estimate the force of any argument opposed to his preconceived opinions. But so many obstacles presented themselves to this arrangement, that I determined to commence at once, by a full exposition of my views of the disorder, and by constant reference to established facts, to counteract, as far as possible, those sources of uncertainty which, under this arrangement, might otherwise have presented themselves. Nothing but a firm conviction of the necessity for a full recognition of the true nature of the disease, with a view to its scientific and successful treatment, could have induced me to enter so fully as I have done, into the various circumstances which bear upon this important question; and if such details appear out of place in a treatise intended to be purely practical, their insertion will, I trust, be excused, on account of the information they afford to the Physiologist.

The space allotted to those diseases of the Heart which arise so frequently in connection with Rheumatism, may, at first sight, appear unnecessarily large. But the importance of these affections cannot be over-estimated.

They may complicate and render formidable the simplest case of Rheumatism, and may affect the future as well as the present safety of the patient ; moreover, they are the very points on which the Student is most in need of instruction and advice. Their incursion is often insidious, their progress rapid ; and he who is not well informed on all that relates to their symptoms and treatment, may often overlook their existence, and fail to avert their most dangerous consequences. I have therefore been unwilling to omit anything which may lead to a just estimate of their importance, to a full understanding of their physical signs and symptoms, and to a due appreciation of the various grounds on which their treatment should be based.

I have availed myself of the labours of my predecessors, wherever their views have appeared to me correct ; and have uniformly acknowledged the source and extent of my obligation. Where, as on some points, I differ from those, for whose judgment and experience I have the greatest regard, I have not hesitated to avow it, and to point out the grounds of my opinion. In so doing, I have strictly adhered to facts, and believe I have stated nothing which will not be confirmed by more extended inquiries.

To my colleague, and former teacher, Dr. J. A. WILSON, Senior Physician to St. George's Hospital, I am indebted for having first awakened my mind to the necessity for a complete and searching investigation into the source, nature, and treatment of Rheumatism, as also for allow-

ing me to test the respective merits of topical applications in several well-marked cases. To my friend and colleague, Dr. BENCE JONES, my best thanks are due, for his uniform kindness in affording me opportunities of treating the disease in its more acute and terrible form: I am also indebted to Dr. BLACKALL, Senior Physician to the Dreadnought Hospital Ship; to Dr. FINCHAM, formerly Physician to the Pimlico Dispensary; and to several other of my friends, for opportunities of treating the disease, or of witnessing the effect of treatment.

How far the conclusions at which I have arrived will be confirmed by further experience, time alone can decide, but the labour I have bestowed upon the investigation will not have been thrown away, if it has enabled me to make some little addition to our slender stock of knowledge on this important and fearful disease.

13, MANCHESTER SQUARE;

August, 1852.

PREFACE

TO THE

SECOND EDITION.

THE favorable reception accorded to this work by my professional brethren in England, as also in America, where it has been reprinted, has encouraged me to undertake its complete revision, preparatory to the issue of a second edition. Errors have been corrected, omissions supplied, and whatever appeared to need further elucidation has been carefully rewritten, or more fully explained. Throughout the work, but especially in the chapters on Rheumatic Gout, Chronic Rheumatism, and Sciatica, much additional matter has been inserted, which, as founded on a large number of personal observations, backed by communications received from medical men in various parts of the world, will be found, I believe, of practical value.

My views in regard to the treatment of the acute disease have not undergone any essential modification since the year 1845, when I first had recourse to full and repeated doses of alkalies and the neutral salts, and I am glad to

find that Dr. Garrod and many others, who, within the last four years, have made trial of these remedies in the cure of Rheumatism, have confirmed, to the letter, the statements made in the first edition of this work.

It will be a further satisfaction to learn, that the suggestions thrown out in the present edition relative to the successful treatment of certain chronic forms of the disease, are as fully borne out by the experience of others ; and I shall deem it an especial favour, if those persons whose opportunities enable them to throw any light on the subject will kindly favour me with the result of their observations.

13, MANCHESTER SQUARE ;
October, 1856.

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RHEUMATISM, RHEUMATIC GOUT AND SCIATICA.

CHAPTER I.

INTRODUCTION.

“Quamvis enim cedere auctoritate debeam, rectius tamen arbitror, in tantâ re, ratione quam auctoritate superari.”—PLINY, Lib. i, Ep. 20.

FEW diseases are more deserving of attention than that common, painful, and obstinate malady which has been recognised under the title of Rheumatism. Whether viewed in relation to the number of its victims, the amount of present suffering it inflicts, or the terrible disease of the Heart which it entails, it ranks among the most formidable of human ailments. Its importance, however, in the estimation of the physiologist is derived, not only from its prevalence and severity, but from the mystery in which it has ever been involved. Obscure in its origin, and in its subsequent course uncertain and variable, its source has hitherto remained undiscovered, its phenomena unexplained, its treatment unsatisfactory; and, by common consent, it is ascribed to a cause which affords not the slightest clue to its nature, nor the least explanation of its varied phenomena.

Many persons consider exposure to cold sufficient to induce an immediate attack, and though rheumatism not unfrequently occurs without the slightest exposure, though even when exposure has taken place, fresh joints are attacked long after all exposure has ceased; nay, more, though the ascertained local and general effects of cold differ altogether from the symptoms of rheumatism, yet some, even among the profession, have been found to adopt this prevalent notion, without an attempt to show that cold either does or can produce the effects assigned to it.

Others have endeavoured to point out the precise nature of the influence exerted, and have suggested that cold, by suspending cutaneous secretion, and so giving rise to the retention of effete matters in the blood, is explanatory of the varied phenomena of the disease. But rheumatism may, and does sometimes occur under circumstances which entirely preclude the agency of cold;—it is not by any means of common occurrence, even when the skin's function is suspended by disease; and when once it has arisen, it sometimes continues with great severity for months after the action of the skin has been re-established, and profuse and constant perspiration has been set up.

By others, a temporary exposure to cold has been justly deemed insufficient to account for symptoms so severe and erratic in their nature, so variable in their mode of onset, and, in many cases, so extremely obstinate in their continuance. Accordingly, of late years, a theory has been broached more consistent with the train of physical events, and rheumatism has been referred to the irritation of a morbid matter in the blood, which though possibly derived, in part, from the stoppage and consequent retention of the perspiration, through the influence of cold, is, to a far greater

extent, generated in the system, as a product of impaired or perverted assimilation—of vicious metamorphic action.

This doctrine is as yet imperfectly understood, and even by its warmest advocates has been hardly carried to its legitimate conclusion. It may be well, therefore, to explain the grounds on which its acceptance rests, to point out the universality of its application, and to show how important is its practical bearing.

First, however, it will be necessary to advert to the local and general effects of exposure to cold, as actually proved by experience.

When any part of the body is subjected to a low temperature, or to the combined influence of cold and moisture, the first symptoms of such exposure is a sensation of cold in the part exposed, accompanied by a pallor or blueness of the skin. If the exposure be of short duration, and the degree of cold moderate, the circulation is soon re-established after removal from the cold, and no ill results ensue.

When the degree of cold is greater, or the exposure of longer duration, a shrunken state of the skin supervenes, the circulation in the part is partially and sometimes almost entirely arrested, and when warmth is again applied, gangrene may result, if care be not taken to prevent reaction taking place too rapidly. If proper caution is observed, nothing unusual is remarked in the part beyond a temporary glow or increased heat, which gradually subsides altogether.

If the intensity of the cold be still greater, or exposure even to a moderate degree of cold be of longer duration, the parts exposed will probably be frost-bitten and become gangrenous and die. In every instance the *local* effects, though varying somewhat in different persons, are proportioned, *cæteris paribus*, to the intensity of the cold and the

duration of the exposure, and are manifested only in the parts exposed.

The *general* effects of exposure to cold are equally well known, and are also strongly marked. Up to a certain point, which varies in different individuals according to their condition and the activity of the circulation, cold evidently acts as a decided stimulus. It produces muscular contraction, and imparts vigour to the system. But intense cold, or long-continued exposure even to a moderate degree of cold, has a directly opposite effect. It gives rise to chilliness, or even shivering, with muscular and nervous exhaustion, a diminution in the force of the heart's action, and general depression of all the natural functions. This depressing influence may proceed to such an extent as to produce a species of stupor, an almost irresistible desire to sleep, with excessive feebleness of the heart's action, and death as its natural result.

It will be observed that the phenomena primarily produced by cold are totally unlike the symptoms of rheumatism.¹ No wandering pains; no redness or swelling of

¹ I employ the word *primarily* with the view, firstly, of pointing out that rheumatism does not occur as an immediate effect of mere abstraction of heat; and, secondly, of guarding against the supposition that cold is never concerned in its production. It will be seen, in the latter part of this chapter, that cold does sometimes prove the efficient cause of the disease, by exercising a depressing influence, interfering with the business of nutrition, and so, through perverted assimilation, giving rise to the formation of the *materies morbi*. But I wish it to be distinctly understood, that mere abstraction of heat will not produce rheumatism, except in the indirect manner just alluded to, and that the disease, therefore, cannot be attributed strictly to cold. The only true or essential cause of the disease is a poison in the blood, the formation of which may be occasioned by many accidental causes of perverted nutrition, of which exposure to cold is one.

the joints; no symptoms, indeed, of any moment present themselves unless the cold be intense, and even then they bear no resemblance to the symptoms of rheumatism. Nay, more than this: the experience of travellers has proved beyond all question, that in healthy persons, the most extreme and rapid variations of temperature are insufficient to excite the disease.¹

Some persons, however, maintain that cold, though of itself inert, becomes a powerful agent in the production of rheumatism when acting in conjunction with damp and moisture. Doubtless, under such circumstances, it proves an active predisposing cause of this, in common with many other disorders; and it may also become an exciting cause when a predisposition already exists. But the significant fact, that numberless persons are constantly exposed to the combined influence of cold and moisture, and that never-

¹ Captain Parry, in his account of 'A Voyage for the Discovery of a North-West Passage,' observes (p. 134), "We were constantly in the habit for some months of undergoing a change of from 80° to 100°, and in several instances of 120° of temperature, in less than a minute; and what is most extraordinary, not a single inflammatory complaint, beyond a slight cold, which was cured by common care in a day or two, occurred during this particular period." Throughout the expedition, the occurrence of rheumatism, or indeed even of rheumatic pains, was exceedingly rare.

Again, Colonel Sir J. Mitchell, in his 'Journal of an Expedition into the Interior of Tropical Australia,' reports that "they were subjected almost daily to variations of temperature of nearly 50°," and yet he makes no mention of the occurrence of rheumatism.

And again, it appears from the statistical reports of cases which have occurred among our troops stationed in different parts of the world, that out of every 1000 patients admitted into the military hospitals, there are 57 cases of rheumatism at the Cape of Good Hope, the land of heaths and geraniums, and 30 only in the cold and variable climate of Nova Scotia and New Brunswick.

theless, no instance is on record in which rheumatism has occurred simultaneously in any large number of persons, is sufficient to show, that the influence alluded to cannot be the proximate or essential cause of the disease. Amidst all the horrors of the Russian campaign, with sleet falling, and men dying on all sides from the effects of cold and wet, it was hardly more prevalent than at any other time;¹ and the same observation has been made, when soldiers, heated by their march and drenched to the skin, have had to repose on the cold wet ground.²

Indeed, it needs little observation to prove, that cold and atmospheric vicissitudes are not *essential* to the production of rheumatism. Persons in private life are frequently seized with active symptoms of the disease without having been subjected to the slightest exposure; and in hospital practice, patients who have been admitted for some other complaint, and have been confined to bed for weeks in a ward heated up to 65° Fahrenheit, are sometimes attacked by it in a most violent manner. In such instances the symptoms are just as severe, and continue just as obstinately, as in cases where there has been the greatest exposure.³

¹ During the three or four exceedingly cold days which immediately preceded the battle of Eylau, the mercury had fallen to 10, 11, 12, 13, 14, and 15 degrees below zero, of Reaumur's thermometer, (or, in other words, to below zero of Fahrenheit); and during these days, and during a great portion of the nights of the 5th, 6th, 7th, 8th, and 9th of February, "the soldiers had been exposed to the snow and frost," yet "no soldier presented himself at the ambulance," and "it was not until the night of the 10th, when the temperature had risen about 18 or 20 degrees, that they felt the first effects of cold." They then began to suffer, not from rheumatism, but from "gangrene of the extremities, one of the common and true effects of cold." (Baron Larrey's 'Mémoires de Chirurgie Militaire,' vol. iii.)

² Pringle's 'Observations on Diseases of the Army.'

³ Numberless cases of this sort might be cited, but one which I

But more than this : it frequently happens, that some ten days after the commencement of an attack, the knee, or some part which had previously escaped, becomes hot and red, and swollen. Whatever the cause of the first articular inflammation, the fresh inflammation cannot reasonably be attributed to the effect of cold, inasmuch as from the patient being confined to bed, the joints are necessarily protected from its influence. In order, therefore, to account for this singular phenomenon, a vague and untenable hypothesis has been resorted to ; and it has been suggested, that the fresh inflammation set up, is due to a transference of inflammatory action from another part of the body. In some instances such may be the case ; but observation has proved that it is usually a mere extension of the disease, occurring where no subsidence of inflammation has taken place.

Sometimes when the complaint has nearly run its course, and the pain and inflammation have in great measure subsided, the symptoms recommence in all their severity without fresh exposure, and without any obvious exciting

take at random from my note-book will suffice for an illustration of the subject. William Edmonds, æt. 34, who was admitted into St. George's Hospital on the 30th of April, 1840, under the care of Mr. Keate, was confined to his bed by severe ulceration of his leg. He was much out of health, but presented no symptoms of rheumatism until the 25th of May, when, after lying in bed for a period of nearly four weeks, he was seized with wandering rheumatic pains. These gradually increased in severity, and on the 1st of June his right hip became exquisitely painful, and both his hands and wrists red, swollen, and inflamed. In short, an attack of acute rheumatism commenced, and, in spite of treatment, ran its usual course. Such instances have not escaped the notice of the observant Mons. Chomel ; and, accordingly, after quoting several in point, he has expressed it as his opinion (' *Leçons de Clinique Médicale*, tom. ii, p. 153), that " the impression of cold is not a necessary precursor of acute rheumatism."

cause. Even had the first attack arisen from cold, the recurrence of the disease without fresh exposure, proves it totally independent of any such agency.

The same fact is fully and unequivocally attested by the history and entire progress of the complaint. The articular symptoms of rheumatism are extremely migratory; they do not cease on the re-establishment of perspiration, and they are sometimes preceded, and after a time very frequently accompanied, by inflammation of the membranous envelopes of the heart.

If they were due to cold, locally applied, they should surely be stationary, as are all local symptoms known to depend on local causes: if due to the repression of the perspiration by cold, they should certainly cease, or be relieved in some measure by the re-establishment of the skin's action; the more so, as in rheumatism the perspiration is excessive, and in its duration most remarkable: and if referable to cold, the heart should surely escape unscathed, protected as it is on all sides from the influence of cold. On this point experience speaks decisively, and shows that for some time the heart is not affected even under the influence of intense cold; and that when, after prolonged exposure, it is affected even unto death, not the slightest inflammatory action is produced, but its impulse becomes feeble, after a time irregular, and ultimately ceases altogether. —On what, then, do the symptoms of rheumatism depend?

If certain substances are introduced into the circulation, fever is set up, rigors often occur, and inflammatory symptoms very shortly supervene in various parts of the body; symptoms which vary in intensity and locality, according to the amount and character of the poison. And if the blood be altered in character, it is practically the same, whether it contain matters foreign to the system, and altogether morbid

in kind, or whether it contain an excess only of some material, a certain amount of which is compatible with health. In either case, it is unhealthy and poisonous in its nature; in either case it contains a "*materies morbi*," which may not only produce fever, or the symptoms of general derangement, but, if irritating in its nature, may give rise to local inflammatory symptoms. Assuming, then, that an abnormal condition of the blood may account for the pain, inflammation, and the curious train of symptoms which constitute an attack of acute rheumatism, I shall endeavour to show that such a condition does actually exist in this disease, and that it is mostly, if not wholly, referable to constitutional causes.

Many of the most remarkable features of rheumatism are quite characteristic of a disease dependent on a vitiated condition of the circulating fluid. Its attacks are ushered in by premonitory fever; its local symptoms are erratic, and yet remarkably symmetrical in their arrangement: the heart, the lungs, and other internal organs are prone to be affected; and when metastasis occurs, the constitutional symptoms are such as are met with under similar circumstances in diseases known to be connected with a vitiated blood.

In some cases, the fever is at first so slight, as hardly to attract attention; and then, as in instances occasionally met with among the eruptive fevers, the appearance of the local symptoms affords the first noticed indication of existing disease. But more commonly the patient has been "out of sorts" for some time prior to the full development of the attack; he has probably felt languid, chilly, and uncomfortable; the appetite has been capricious; he has had a sour or bitter taste in his mouth, and has experienced dull, aching pains in the limbs;—symptoms which indicate constitutional derangement, and together mark the onset of fever. And it

will be observed that, in many important respects, this *rheumatic* fever differs from that which results from local mischief. The fever which accompanies local affections is invariably developed *after* the commencement of local mischief, is commensurate with its intensity, and decreases or increases in exact proportion to the extent and intensity of the local mischief; whereas in rheumatism, as in other diseases known to be dependent on a poisoned blood, it generally *precedes*, for a considerable time, the full development of the local symptoms, not unfrequently decreases directly local inflammation is set up,¹ and is invariably aggravated by its sudden or premature subsidence.

So also in regard to the erratic nature of the articular inflammation. When inflammatory action is excited by a truly local cause, as, for instance, by a blow, nobody ever imagines that it can possibly subside in the spot first affected, and reappear in some distant part of the body. On the contrary, it is an admitted fact that, when any mischief is really local, the inflammation is also local and stationary. On the other hand, whenever the blood is poisoned, as when pus, for instance, has been taken into the circulation, we are never surprised at the occurrence of symptoms in any part, however distant from the original seat of mischief, inasmuch as the poison circulates with the blood to every tissue of the body, and may irritate and ultimately excite inflammation in several parts successively. Thus the joints, the heart, the lungs, and the nervous centres, may be affected simultaneously or in succession, whilst the functions of the skin, the liver, and the kidneys, may be also more or less

¹ "Febris autem sensim evanescit, manente dolore, quin et nonnunquam inmanius saeviente, materiâ scilicet febrili in artus translata." (Sydenhami Opera, sect. vi, cap. v.)

interfered with. Such, also, is the case in regard to rheumatism.

On the same ground, the symmetry of the local symptoms of the disease affords additional evidence of the poisoned condition of the circulating fluid. For if the blood itself be at fault, it is but consistent with reason to suppose that, permeating as it does every tissue of the body, it should ultimately give rise to similar changes in parts corresponding in function and organization, whereas, under any other supposition, the proneness of the disease to affect similar parts on either side of the body is utterly inexplicable. The peculiarity in question has been shown by Dr. W. Budd¹ to obtain in all disorders connected with a vitiated condition of the circulation, and why take exception to rheumatism; why exclude a disease presenting such curious illustrations of the fact?

Again, that inflammation of the heart is liable to arise, and forms one of the most frequent as it is one of the most formidable complications of rheumatism, is a fact most painfully verified by experience, and it is equally certain that it sometimes occurs prior to the setting-up of any articular or other external symptom of the disease.² In cases where it is preceded by pain, redness, and swelling of the joints, it has been ascribed to a transference of morbid action consequent on the subsidence of articular inflammation. The advocates of this doctrine have never attempted to explain in what way such translation takes place, and have failed in showing that it does occur in any disorder known to be truly local, yet they have not hesitated to urge this view in explanation of the phenomenon

¹ 'Medico-Chir. Trans.,' vol. xxv.

² See Cap. VI. of this Treatise.

in question. But even if admitted to its fullest extent, it utterly fails in elucidating the symptoms. For in the majority of instances where pericarditis or endocarditis is met with, there is not the slightest, even temporary, subsidence of the external or articular inflammation; and since inflammatory action about the heart is occasionally the *earliest*, and for some time the *only local* symptom of rheumatism, metastasis, however vaguely understood and applied, must obviously fail in clearing up the mystery. Indeed the only explanation appears to be that the heart is affected through the agency of the blood, which from some cause has become unhealthy and irritating in its character.¹

On the other hand, the symptoms usually observed when metastasis does in reality take place, when the external inflammation suddenly subsides, and cardiac inflammation simultaneously or shortly afterwards commences, afford most striking confirmation of this view, for they correspond precisely with those observed under similar circumstances in cases where the blood is known to be affected. Rigors almost invariably occur, followed by increase in the febrile symptoms; there is generally much anxiety of countenance, and evidence throughout of constitutional irritation; the breathing is hurried, the heart's action accelerated and sometimes irregular, and before the symptoms are again locally fixed, it not unfrequently becomes intermittent. In the mean time pains of a spasmodic character occur in

¹ Mons. Chomel, among others, has recorded a series of most interesting observations, which tend to show, that the internal inflammations in rheumatism, like those of smallpox, typhus, scarlatina, &c., are referable to an alteration of the animal fluids, more especially the blood. ('Leçons de Clinique Médicale,' 1834, pp. 529-539.)

various parts of the body ; hiccup ensues, or vomiting, or perhaps diarrhœa supervenes, which, though usually but little under the control of medicine, subsides together with the other phenomena on the re-establishment of local symptoms.¹

The fact is, the doctrine of a poisoned blood in rheumatism, though seldom fully recognised in theory, is tacitly allowed full weight in determining some points in practice. When a person is suffering from the irritation of a diseased joint, the result of local injury, amputation by removing the part affected gets rid of the disease, and the accompanying fever ; and if rheumatic inflammation were in like manner a purely local affection, the knife would in that case also effect a radical or permanent cure. But no one would propose the adoption of such a remedy in the case of an inflamed rheumatic joint. The fruitlessness of such an attempt to get rid of the disease is at once acknowledged and acted on : the blood itself being the source of irritation, the mere removal of one of the local effects of that irritation would obviously be ineffectual in eradicating the complaint ; the inflamed part might be removed by the

¹ Dr. Holland remarks ('Medical Notes and Reflections,' cap. "Metastasis"), "The high state of fever, notable disturbance of the heart, and of other functional derangements which constantly occur during the translation of disease, and which subside in great measure when the symptoms are again locally fixed, is a powerful argument in favour of a morbid matter in the blood itself."

In rheumatism, such phenomena are somewhat rare, but I have seen three instances of their occurrence. One was the case of a boy, æt. 16, under my own care at St. George's Hospital ; another, that of a man in King's Ward, under the care of my colleague Dr. Wilson ; and the other that of a lad admitted into Fuller's Ward, under the care of Dr. Seymour. In all these cases there was extreme vascular excitement, with obstinate vomiting followed by diarrhœa.

scalpel, but there would be nothing in its removal to prevent the immediate occurrence of inflammation in any other part of the body.¹

If further proof were required, I might refer to the analogy between rheumatism and gout.

So curiously do these two disorders coincide, so imperceptible in certain cases is the transition from the one to the other, that there is no little difficulty in distinguishing between them. In both, an hereditary taint may frequently be traced; in both, the fever is out of all proportion to the extent and severity of the local mischief; in both, the joints are the parts principally affected, and the inflammation, which is of a peculiar nature, observes a remarkable symmetry in attacks; in both, internal organs are often implicated, and in both, anomalous symptoms of a similar character occur whenever metastasis takes place. And not only so:—their affinity becomes even more apparent when their history is more closely and accurately examined. For it is then found that whilst children of gouty parents are peculiarly subject to attacks of rheumatism,² the offspring of a rheumatic stock no less frequently show symptoms of that hybrid disorder, rheumatic gout, and in some instances of unequivocal gout. Such a striking analogy between the

¹ "The heat, redness, and swelling (of the joints), are no more the cause of the constitutional disturbance in acute rheumatism than the scarlet-rash or the smallpox pustules of the fevers which bear their respective names. They are but the partial expression, by impaired nutrition, of a disorder that is general in the system." (Dr. Wilson on the "True Character of Acute Rheumatism," 'Lancet' for 1844, vol. ii, p. 192.)

² "Rheumatism is undoubtedly nearly allied to gout, and fits of it have been more common in children born of gouty parents." (Dr. Heberden's 'Commentaries,' p. 399.)

symptoms of the two disorders is surely sufficient to warrant our assuming a similarity of cause, and as in gout the existence of a *materies morbi* admits of actual demonstration,¹ our view is confirmed, as to the existence of a poison in the blood in rheumatism.

Whence then does this poison arise? From what source and by what means does the blood become vitiated?

There are many circumstances in the history of rheumatism which point to its being of constitutional origin.

The earliest and most frequent victims of the disease, even when considering themselves in tolerable health, are apt to experience symptoms clearly denoting functional derangement. Though strong, perhaps, and equal to much bodily exertion, they are peculiarly sensitive to atmospheric vicissitudes, are prone to perspire, and their perspiration has a sour² disagreeable odour, whilst their urine, though usually clear when passed, not unfrequently deposits, on cooling, a red brick-dust sediment, a sediment of the lithates and lactates. So constantly are these symptoms associated with a tendency to rheumatism, that they have been recognised as indicative of a "rheumatic diathesis," or, in other words, of a case of constitution peculiarly prone to the incursion of rheumatism. And it has been observed that in persons so predisposed, the heart is irritable, and prone to take on inflammatory action, and that even when it is not attacked by inflammation, its nutrition is apt to become

¹ Dr. Garrod has demonstrated by chemical analysis the existence of uric acid in the blood of gouty patients, and its absence from the blood in rheumatism. (See 'Med.-Chir. Trans.,' vols. xxxi. and xxxvii.)

² A rheumatic gentleman not long since assured me, that he is unable to carry a knife or other steel instrument in his pocket, in consequence of its becoming rusty from the acidity of the perspiration.

perverted, its valves more or less diseased, and its walls thickened in consequence. Moreover, erratic pains ensue on the slightest derangement of the general health, and are relieved not by any specific treatment, but by shower-baths, or tonics, or whatever tends to improve the general health.

Again, it has been remarked, that whereas certain persons are subject to rheumatism, others under precisely the same circumstances, of the same age and sex, living in the same locality, sometimes even in the very same house, exposed to the same atmospheric vicissitudes, and following the same pursuits,—placed, in short, in a precisely similar position with regard to external influences,—remain perfectly free from the disease.

And again, that certain persons, who during the whole of their previous existence have lived in perfect immunity from the disease, become suddenly tormented with it on changing their mode of living, or from some less obvious cause, whilst others who had long laboured under this affliction, get rid of their troublesome enemy in an equally remarkable and mysterious manner.

From these general facts alone it might be inferred, that the materies morbi on which the symptoms of rheumatism depend, is generated under certain circumstances in the system, and is so generated as a result of some obscure constitutional peculiarity, some particular form of mal-assimilation.

But there are other facts which tend directly to the same conclusion. The disease generally makes its appearance in those subject to its invasion, whenever the system is lowered or deranged. It is so frequent an attendant on disordered conditions of the uterine system, that its intimate connection with retained uterine secretions has been suggested by

Dr. Todd¹ and other observers. M. Chomel² has been struck with the frequency of its occurrence after excessive lactation, after inordinate indulgence of the sexual desires, and during tedious recoveries from fever;³ and all who have carefully studied the disease in the vast field of observation afforded by the wards of our public hospitals, must have remarked how constantly its attacks have been preceded by functional derangement.

The important observation of Sir John Pringle,⁴ that rheumatism is more prevalent at the commencement of a campaign and shortly after return to garrison, than at any other period of a soldier's career, comes in perfect confirmation of these interesting gleanings from civil life. For nothing can be more in accordance with experience, than that temporary derangement of the system should be produced by the entire change of life which a soldier undergoes when first called into the field, and when again, after active service, he returns to the close confinement of the barrack. Whereas, under no other supposition is it possible to account for the prevalence of the disease at the very times when the soldiers are best equipped, most protected against atmospheric vicissitudes, and free from the many privations and the exposure inseparable from active service.

There are other facts of a different character which bear just as strongly on the solution of this question. It has now been established beyond dispute, that rheumatism,

¹ On 'Rheumatism,' p. 149.

² 'Leçons de Clinique Médicale,' tom. ii, p. 151.

³ "Enfin on le voit souvent se manifester pendant la faiblesse qui occupe toujours la convalescence." (Op. cit., p. 467.)

⁴ 'Observations on Diseases of the Army,' part I, cap iii and iv; part II, cap. i; part III, cap. iii.

like gout, is distinctly hereditary.¹ And if the general law of hereditary affections, as Sir Henry Holland asserts,² be that so ably developed by Dr. Prichard, viz., that "all original connate bodily peculiarities tend to become hereditary, while changes in the organic structure of the individual, from external causes during life, end with him, and have no influence on his progeny," it follows that rheumatism, being an hereditary disease, must be in its nature constitutional.

Perhaps the strongest proof of its constitutional origin, is to be found in the variable and often long duration of the disorder. For unless it be admitted that the *materies morbi* may be generated *de novo* in the system, the long continuance and frequent recurrence of the articular symptoms are altogether inexplicable. If the disease were dependent on a poison introduced into the system from without, it should manifest some of the peculiarities of disorders which acknowledge such an origin; it should occur more or less periodically or epidemically: it should run a somewhat regular and definite course, and should confer upon a person who has once experienced its attacks, an immunity from, or partial protection against, its future invasion. But rheumatism is always met with sporadically; its career is remarkably variable and uncertain;³ and so far from a well-developed attack affording protection against

¹ See Cap. ii, p. 32.

² 'Medical Notes and Reflections,' cap. on "Hereditary Affections."

³ In one case, it runs a short, acute, and regular course; in another, the patient experiences relapses, in each of which, the original symptoms not unfrequently recur with all their former virulence; while, in a third case, the disorder lingers on for months in a sub-acute form, aggravated by irregularly periodical exacerbations.

its future invasion, it is generally believed, that a person who has once been subjected to its influence, is peculiarly liable afterwards to its invasion. And if, which is the only other supposition, the disease were dependent on the irritation of a matter resulting from temporary suspension of the skin's function, it should subside on the re-establishment of a free cutaneous action; the more so, as in a well-developed attack, the perspiration is constant and excessive.

As, then, it appears impossible to avoid the conclusion that the *materies morbi* is generated in the system as a product of mal-assimilation, or faulty metamorphic action, the next points for consideration are those which serve to indicate its nature.

A suggestion was thrown out by Dr. Prout, and has been adopted and enlarged upon by Dr. Todd in his Croonian Lectures, that all the phenomena of the disease are referable to the presence of lactic acid, which is developed too freely in the system in consequence of imperfect assimilation, and accumulates in the blood by reason of defective cutaneous action. "It is no wonder," says Dr. Todd, "that as lactic acid is imperfectly excreted through its natural channels, in consequence of the influence of cold in checking perspiration, and is too freely developed in the alimentary canal, it should accumulate in the blood and become eliminated at every point. Moreover, the long continuance of the causes which produce the defective cutaneous secretion and the deranged gastric one, will give rise to the development of lactic acid in the secondary processes of assimilation, thus infecting the blood from every source, and tending to perpetuate the diathesis."

More recently this view has been somewhat modified, and has received more complete and satisfactory elucidation,

from Dr. Headland, in his valuable treatise on the action of medicines.¹ After referring to the commonly received opinion, that before the starch of the food can be applied to the maintenance of the animal heat, it has to be converted into lactic acid, which then combines with oxygen to form carbonic acid and water, in which form it is thrown out of the system by the lungs, he points out how anything which interferes with this oxidation of lactic acid, must lead to its excessive accumulation in the system. He thus suggests that simple "want of vital energy or nervous force," or "a failure of some natural principle which is gifted with the control and direction" of the chemical changes in the blood; or, in short, any disturbing cause, of whatever nature, which may tend to prevent the normal series of changes from taking place, may lead to the accumulation of lactic acid in the system, and so may prove the accidental or exciting cause of rheumatism. And he leaves it to be inferred that the disease is usually due to such causes rather than to the non-excretion of lactic acid by the skin, or to its excessive formation in the primary or secondary processes of assimilation.

My own opinion is strongly in favour of this view, which alone of all the theories hitherto propounded, is reconcilable with the admitted facts, that rheumatism may occur under a great variety of circumstances, and at times when the digestive organs are but little deranged; that it may arise without any exposure to cold, or arrest of the skin's function; that it continues after the skin's action is re-established; and that it may be, and often is, occasioned by influences prejudicial to the general health.

It is true that the poison which gives rise to rheumatism

Headland 'On the Action of Medicines,' pp. 85-90.

has not as yet received actual demonstration, but many facts conduce to a belief in its identity with some natural excretion of the skin. In advanced life, when, from want of energy in the system, the skin's action is readily interfered with, pain or stiffness is so constantly produced by a draught of cold air, and subsides so soon after reaction has taken place, that we are bound to admit its intimate connection with temporary suspension of cutaneous action.¹ Moreover, rheumatism is so common among persons suffering from renal disease, and other complaints accompanied by a harsh inactive condition of the skin, that it is impossible not to connect its appearance, under such circumstances, with the cessation of free cutaneous transpiration.

The means which nature adopts for its relief, and the circumstances which attend its imperfect development, are also suggestive of a relationship between rheumatism and cutaneous secretion. No sooner is a person attacked by the disease than excessive perspiration is set up, as if with the view of getting rid of some peccant matter, and

¹ This instructive fact may appear at first sight to countenance the hypothesis of cold as the universal cause of rheumatism. But, in reality, it will bear no such construction. For although the poison which produces the local symptoms of the disease is in all instances the same, it is necessarily small and definite in quantity when attributable solely to checked perspiration, and the symptoms, therefore, to which it gives rise must, and do gradually subside from the time when the function of the skin is re-established. But it is notorious, that in rheumatism, the development of free cutaneous action has seldom much immediate influence in arresting the symptoms. This arises from the fact, that the poison in these cases is constantly generated *de novo* in the system, and its production being dependent on many contingent circumstances, its amount is indefinite, and the symptoms therefore produced through its agency are uncertain and variable in duration.

the secretion is most profuse at the very part where local inflammation is taking place.¹ If the perspiration be checked, or take place irregularly or imperfectly, the disease is protracted, and is rarely got rid of until free cutaneous action has been re-established. It is probable, therefore, that in lactic acid we have discovered the actual materies morbi.² Be this as it may, the ordinary symptoms of the disease, no less than the history of its rarer modifications, are calculated to point to some excretion of the skin as the immediate cause of rheumatic inflammation.

One other point, in connection with this subject, is well deserving of attention, I mean the specific nature of the poison which constitutes the essence of rheumatism. If the matter, which excites rheumatic inflammation and produces the other symptoms of the disease, be in all cases the same, or, in other words, of a peculiar and specific character, it follows that nothing can give rise to rheumatism, properly so called, unless it have the power, either directly or indirectly, of producing this poison in the system. No point in the whole course of medical inquiry is more fully established, than that different poisons have separate modes

¹ I am not aware of having met with this remark in books ; and as the seat of inflammation is often the driest spot in the body, its accuracy may, perhaps, be questioned. It may be well, therefore, to point out the source of this apparent contradiction, which arises from the different condition of the part at different periods of the disease. When a spot is just beginning to be painful, then it is, before the circulation is much impeded, that excretion will there be found so abundant ; whereas, if no observation be made until progressing inflammation has greatly retarded the circulation, excretion from the part is almost necessarily arrested.

² Dr. C. J. B. Williams, among others, expresses his belief in the origin of rheumatism from a poison, probably lactic acid, in the system. ('Principles of Medicine,' p. 116.)

of action, and produce each its own peculiar effect.¹ What weight, for instance, would be attached to the testimony of a man, who stated that he had known the poison of glanders give rise to hydrophobia, or that of measles to smallpox? Yet in what disorder are the general phenomena more striking, and the local effects more singular and remarkable, than in acute rheumatism? A peculiar and specific character is so clearly stamped on this disease, that no one will attempt to question it; few on due consideration will deny its dependence on a poisonous matter in the system; all, therefore, ought to agree as to the specific nature of that poison. But, in defiance of those very laws, the due appreciation of which alone makes any study a science, rheumatism has been referred to a dozen different causes, and inferentially at least to as many different poisons. It has been attributed to checked or deficient perspiration, to exposure to cold or to malarious exhalations, to indigestion and imperfect assimilation, to defective or perverted uterine action, to the ill-performance of the renal functions, to plethora, and to debility; to one cause or to another, as the history of the case or the appearance of the patient may at first sight have seemed to warrant. Now I will venture to assert, that although a dozen different predisposing

¹ "The relative bearing of cause and effect is the grand physical principle which alone makes medicine worthy of our study, for if it be supposed that agents capable of acting in the human body have not each their definite mode of action, we can neither determine the seat and course of any given disorder, nor judge of the operation of remedies; whereas, if the definite action of causes be allowed, we are enabled to determine, within certain limits, the course, symptoms, and pathological phenomena which result from the action of any known agent." (Dr. Williams's Introduction to a 'Treatise on Morbid Poisons.')

causes may tend to the production of the rheumatic virus in the system, and a dozen different exciting causes may each separately promote its action and give rise to the immediate development of the symptoms, yet that the poison which is to produce a regular and determined disorder like acute rheumatism, must be invariably the same, must be in itself peculiar,—specific, as giving rise to a specific affection.

Dr. Todd has suggested, that disordered uterine secretions may be an occasional cause of rheumatism. He conceives, “that the secretions of the uterus, if of an unhealthy character, and not duly thrown off, may be absorbed into the circulation and contaminate the blood, producing symptoms of greater or less urgency, according to the nature and quantity of the morbid secretion which may have been absorbed.”¹

¹ ‘On Rheumatism,’ p. 149. In support of his position, Dr. Todd cites a case in which a state of protracted amenorrhœa, painful menstruation, and disordered uterine function, was entirely relieved by the occurrence of a paroxysm of acute rheumatism. The individual in whom these symptoms occurred, was a country girl, 23 years of age, who had come to town about twelve months previously. Whilst in the country she had exhibited well-marked symptoms of a rheumatic tendency, having suffered from wandering rheumatic pains; and when she came to London the rheumatic symptoms increased, her health began to fail, and after a time the catamenia ceased. In about six weeks after this she began to suffer from severe uterine pains, which continued for about five months, when an attack of acute rheumatism supervened, and all her symptoms disappeared.

The case is interesting, from the clear evidence adduced of the protracted existence of the rheumatic diathesis, from the lengthened premonitory indications of its ultimate development, and from the clear proof afforded, that the uterus may be affected by the irritation of the rheumatic poison as well as the heart and other parts of the body. But the inferences drawn from it by Dr. Todd appear to me incon-

Now, I am ready to admit, that nothing so easily deranges the whole female economy, produces more perverted actions in the system, and therefore tends more directly to the generation of the peccant matter of rheumatism, than does disordered uterine action. But if a certain product of faulty assimilation be at once the essence and cause of rheumatism (and Dr. Todd himself has adduced powerful arguments in favour of such a supposition), then the retained or altered secretions of the uterus cannot give rise to the same phenomena, unless they be identical in nature with this said product of mal-assimilation; and to this, analogy would lead us to demur.

But although a specific poison, generated in the system as the result of faulty metamorphic action, is the primary or proximate cause of rheumatism, and constitutes the actual *materies morbi*, yet many agencies may conduce to the formation of the poison and to its retention in the

sistent with the recorded facts. So far from disordered uterine secretion having been the *cause* of the rheumatic symptoms, clear evidence is offered of a strong rheumatic tendency at a time when the uterine functions were in no way disordered, for she had suffered from rheumatic pains in the country when she was otherwise in good health, and her health had begun to fail before the catamenia ceased. My interpretation of the case would be, that before coming to town she had acquired a strong rheumatic tendency, and that, when after reaching London, her general health gave way, the functions of the uterus became disturbed, the monthly periods ceased, and the rheumatic virus, which is peculiarly prone to affect any part which is functionally deranged, attacked the womb, and gave rise to the uterine pain and its attendant symptoms. The pains she suffered were truly rheumatic, and were to be cured, as Dr. Locock has suggested, in similar cases, by Guaiacum, Colchicum, or whatever may tend to relieve the rheumatism, and in this case were actually relieved by the full development of acute rheumatism, and the consequent elimination of the rheumatic poison, the source of all her previous suffering.

system, and many circumstances may render the body peculiarly susceptible of its influence. These are the predisposing and exciting causes of the disease. Of all such causes, an inherited rheumatic taint is unquestionably the strongest. It exerts its influence, slowly, perhaps, but surely ; and few who have succeeded to this unfortunate inheritance, but at some period of their life exhibit symptoms of that peculiar state of system which has been recognised under the title of the "rheumatic diathesis." Thus, many varieties of functional disturbance, many forms of hepatic and uterine derangement, and those diseases of the kidney connected with albuminous urine,¹ by impairing the general health, perverting the functions of nutrition and secretion, and interfering, more or less, with the skin's action, may become active agents in the production of this predisposition. Their morbid effects are not confined to the liver, the uterus, or the kidneys: one part of the animal economy hinges so closely on the other, that local mischief occasions general disturbance, and under certain circumstances appears to induce a state of system favourable to the generation of rheumatic poison ; a state of system arising, be it observed, not as a direct and immediate consequence of suspended secretion, but as a sequel of perverted function gradually taken on by the system generally, in consequence of imperfect or morbid local action.²

¹ This is a powerful predisposing cause of the disease, inasmuch, as not only is the skin's action interfered with, but the diseased organs are unable to act vicariously, and so to assist in eliminating the poison.

² The phenomena of gonorrhœa afford an admirable example of how local diseases may gradually give rise to general derangement of the

In like manner cold, by exercising a depressing influence on the system, and thus producing functional derangement, may contribute largely to the generation of the rheumatic poison, and so may damp and malarious exhalations. Excessive venery and long-continued debauchery are in the same way frequently productive of rheumatism, and so is immoderately protracted lactation. Many a woman suffers, soon after her confinement, if followed by great constitutional exhaustion, or as the reward of her folly, in inordinately protracting the period of suckling. Chomel, who observed the frequency of the disease shortly after delivery, refers its appearance, under such circumstances, to the sudden suppression of the lochial discharge. Such an explanation, however, does not hold good. It is difficult to conceive how the lochia *can* have any connection with rheumatism, except as producing functional derangement, and so possibly tending to favour the development of the rheumatic virus in the system; and I have myself seen several cases in which the disease did not appear until some time after the lochial discharge had naturally and entirely ceased; until, in fact, impaired nutrition had begun to follow on the wear and tear sustained by the constitution during delivery, or during lactation carried beyond the patient's strength.

These, then, and many other instances which might be quoted, may be fairly included under the general expression,

system, and so to the production of the peccant matter of rheumatism. So constantly is rheumatism associated with gonorrhœa, that many rheumatic persons, on contracting that disease, can predict with amazing accuracy the accession of rheumatic inflammation of their joints, and not unfrequently of inflammation of the conjunctiva, such as is apt to accompany rheumatism in unhealthy or cachectic persons.

that anything which disturbs the general health, and gives rise to a state of impaired assimilation, becomes, under certain circumstances, a predisposing cause of rheumatism.¹ The only way, therefore, of preventing or counteracting it, is by noting the earliest symptoms of local disturbance, and taking active measures to prevent its continuance, by carefully attending to the general health, and lastly, as the skin is the peculiar emunctory of the poison, by promoting free cutaneous action.

The exciting causes of the disease are extremely numerous, but not being peculiar to rheumatism, they hardly call for comment or observation. Suffice it to say that when the rheumatic poison is present in the system, any disturbing circumstance, even of temporary duration, such as over fatigue, anxiety, grief, or anger, by rendering the system more susceptible of its influence, may prove the accidental or exciting cause of the disease, and that exposure to cold or to atmospheric vicissitudes is almost certain to induce an attack.

The more the history of rheumatism is studied, the more closely and carefully its details are examined, the more obvious does it become that the disease does not result

¹ I am glad to quote, in confirmation of my opinion, some admirable remarks by Dr. Taylor, of Huddersfield. "I believe," he says, "the really efficient cause, to be such a change in the constitution of the body, chiefly, perhaps, of the fluids, as is more or less slowly induced, under the influence of circumstances unfavourable to health, but often operating imperceptibly, and discovered only by very careful investigation; I allude more particularly to improprieties, not necessarily gross ones, in diet, clothing, or labour, and to undue habitual exposure to cold or damp, or anxiety of mind, as well as to other agencies which gradually undermine the health." ('Med.-Chir. Trans.,' vol. xxviii, pp. 462-3.)

from the local agency of cold.¹ But when after long-continued exposure, cold begins to exercise a depressing influence on the system, it at once opens the door to mal-assimilation, and thereby, if a rheumatic tendency exist, to the formation of the rheumatic poison; and when that poison is present in the system it assumes a further noxious potency; it then not only exercises a depressing influence on the system, and thereby renders it more susceptible of the irritation of the poison, but by checking free cutaneous action it stops the natural outlet of the morbid agent, promotes its accumulation in the system, and thereby tends directly to the development of the disease.

Thus it would appear that cold and other external agencies are only predisposing and exciting causes of rheumatism, and that the primary, proximate, or essential cause of the disease, is the presence of a morbid matter in the blood, generated in the system as the product of a peculiar form of mal-assimilation—of vicious metamorphic action. This poison it is which excites the fever,² and produces all the pains and local inflammations which are often found associated in an attack of rheumatism. If the rheumatic virus be present in small quantity only, it may

¹ “Cold is a frequent cause of rheumatic fever, and produces its effects on the joints by interference with the general business of nutrition, not by local influences directly prejudicial to their structure. These organs are never more carefully protected from cold than during the great heats and sweats of the rheumatic fever, yet one large joint after another becomes inflamed in sequel of the constitutional disorder during a period of time extending, it may be, over weeks, from the invasion of the joint first attacked to that of the last.” (‘On the true Character of Acute Rheumatism,’ by Dr. J. A. Wilson, ‘Lancet,’ 1844, p. 193.)

² The fever in some instances may be aggravated by the local inflammations, but it is essentially independent of them, and is frequently well developed long before their commencement.

cause little more than wandering pains in the limbs, and may scarcely induce any perceptible fever, whilst if it exist in larger quantities, it rarely fails to cause febrile disturbance, and excite inflammation in various parts of the body. In that respect, however, its effects are found to vary in different cases. Sometimes, though it cause great febrile excitement, its local agency may be confined to the production of external articular inflammation; at others it may fail to produce arthritis, but may give rise to acute inflammation of the heart; and at others, again, carditis may be one only out of several internal inflammations which it sets up coincidently with extensive articular mischief. Moreover, there appear good grounds for believing that, as in some cases, it gives rise to excessive febrile disturbance for days prior to the accession of articular inflammation, and repeatedly without exciting inflammation of the heart, so in certain instances it may excite the peculiar train of symptoms whereby rheumatic *fever* is characterised, without producing, from first to last, the slightest concurrent local inflammation, whether of the joints, or of the heart, or any other organ.¹

¹ I have met with several instances, in which the development of rheumatic fever has been complete, and in which, nevertheless, the articular and other local symptoms have been slight and evanescent. One case of this sort is reported in Cap. VIII, of this work. In another, in which no articular inflammation occurred until the eighth day of the attack, the fever was from the first most severe and characteristic. Dr. John Taylor has reported similar instances, and Dr. Graves ('Clinical Medicine,' p. 914,) has met with "several well-marked cases of individuals liable to rheumatic fever, and who had previously suffered from attacks of fever with arthritis in the usual form who subsequently, on exposure to cold, were seized with symptoms of pyrexia, which in intensity, duration, and every other particular, were identical with these former fevers, save and except that from beginning to end, not a single joint was inflamed."

CHAPTER II.

ON THE HEREDITARY CHARACTER OF RHEUMATISM.

IN the Introductory Chapter, I have directed attention to a certain state of constitution in which a strong tendency to rheumatism exists as a sequel of disordered or perverted nutrition. To determine the conditions which favour the production of such a state, to ascertain the laws which govern its development, and to discover, if possible, some means of checking or arresting its progress, is a matter of some importance ; and I will, therefore, endeavour to bring together various circumstances which appear to throw some light on the subject.

One of the most suggestive, and for practical purposes the most important, is the hereditary character of the disease under consideration. Rheumatism, like gout, is distinctly hereditary. From father to son its seeds are transmitted and bear fruit in exact proportion to the degree in which circumstances prove favorable to their growth. In those persons who are exposed to atmospheric vicissitudes, and pay little heed to their general health, the soil is congenial and admirably adapted for the full development of the disease ; mal-assimilation is very likely to occur ; the skin performs its function irregularly ; and the poison thus generated and retained in the system can hardly fail to bear fruit to perfection. Not only will a rheumatic diathesis be

established early, but the disposition will increase until it issues in a paroxysm of acute rheumatism.

In others who are attentive to their general health, and carefully avoid unnecessary exposure, the soil is uncongenial, and the seeds either lie dormant, or fail to attain their perfect growth, for lack of sufficient nourishment. The same tendency to mal-assimilation may exist, but so much caution is observed, and such immediate steps are taken on the slightest appearance of functional disturbance, to check or arrest the progress of disease, that no root can be taken before that element, which is essential to the growth of the seed, is eliminated or got rid of from the system. Thus, although a disposition to rheumatism may arise, and may be evinced by the presence of wandering rheumatic pains, yet, with due care, a paroxysm of rheumatic fever may be warded off, and the tendency to the disease, for a time at least, got rid of. There is, however, cause for serious apprehension when rheumatic symptoms have begun to manifest themselves, inasmuch as, however slight and trivial in their character, they are certain evidences of a constitutional change, which may eventually terminate in a paroxysm of acute rheumatism; and the least want of caution, the least exposure, may induce an immediate and violent attack.

The hereditary disposition to rheumatism has been often overlooked or disregarded. Its existence, however, to a remarkable degree, does not admit of reasonable doubt. I have known several families who, for two generations, have been grievously tormented with the disease, and in sundry of whose members it has repeatedly appeared in its most acute and terrible form. Circumstances not unfrequently concur to render our efforts to trace its hereditary character difficult, and often to make them unavailing, yet

we cannot but feel surprised at the large number of cases in which its existence can be clearly ascertained. The records of the Consumption Hospital exhibit the operation of an inherited predisposition in little more than 24 per cent. of the cases there admitted;¹ and the annals of insanity supply data to prove that its influence obtains in less than 13 per cent. among the inmates of lunatic asylums;² whereas, among the rheumatic patients admitted into St. George's Hospital, I have traced it in nearly 29 per cent.;³ and M. Chomel distinctly ascertained it in half the cases admitted in the Hôtel Dieu.⁴ Nor is this the only evidence which can be offered in its favour. M. Roche⁵ has expressed his firm belief in its hereditary tendency; and Dr. Macleod,⁶ and other physicians of eminence in this country, have arrived at the same conclusion. Moreover, this hereditary tendency exists almost invariably in the cases which are earliest and most fully developed;⁷ and we, therefore, cannot fail to join M. Chomel in exclaiming, that the just and striking expression of Baillon⁸—"ut bonorum hæreditates, ita et morborum successiones ad posterios proveniunt"—most fully applies to rheumatism.

I would not, however, be understood to imply that

¹ See 'First Medical Report of the Consumption Hospital.'

² For tables illustrative of this subject, see the 'First Medical Report of the Consumption Hospital at Brompton.'

³	<i>Cases of Acute Rheumatism.</i>	<i>Predisposed by Disease in either Parent.</i>	<i>Per Cent.</i>
In St. George's Hospital .	246	71	28·8
Other Patients	84	25	29·7

⁴ 'Leçons de Clinique Médicale,' tom. ii, p. 126.

⁵ 'Dictionnaire de Médecine et de Chirurgie pratiques.'

⁶ 'On Rheumatism,' p. 3.

⁷ See Table I, appended to this Chapter.

⁸ 'Ballonii Consiliorum Medicinalium,' lib. iii.

rheumatism is *always* hereditary. Doubtless a rheumatic diathesis may be *acquired* under various circumstances, and my observation only goes to the extent, that a person who from youth has suffered severely from rheumatism, will probably transmit a rheumatic tendency to his offspring.

At what age, then, is this diathesis developed? Or, to put the question in a more practical form,—At what age does rheumatism generally appear?

It will be seen by reference to Table II, appended to this Chapter, which gives the result of Dr. Macleod's and M. Chomel's experience, as well as my own observations on the subject, that the usual age for the development of the acute disease, is from about the period of incipient puberty, until the powers of the system begin, in some measure, to fail, very few cases occurring before the age of 15, and comparatively few after the age of 50.

It must not be supposed, however, that rheumatism is confined to the ages above specified. Our sensations teach us, that we grow more rheumatic as we grow older; and the result of extended medical observation shows, that the disease, though not occurring in an acute form in advanced life, does, nevertheless, invade our stiffening limbs more commonly than some persons have been inclined to admit.¹ The cause of the difference in the type of the disorder at different ages, admits of satisfactory explanation. As rheumatism is due to the presence of a *materies morbi*, generated during the destruction and reformation of the tissues, processes which take place with unusual activity during early life, and more slowly as age advances, it follows that mal-assimilation is more likely to be attended

¹ See Tab. III, p. 43.

with an abundant formation of the rheumatic poison, and therefore, with greater severity in the rheumatic symptoms, in early than in advanced life. Moreover, it appears to be a merciful law of Providence, that as man's age advances, and the system becomes less able to bear up against the wear and tear of severe illness, its natural susceptibility to acute disorders should be materially lessened. It thus becomes comparatively insensible to the poison of scarlatina and marsh miasmata, and to the influence of many other noxious matters. So also in regard to the effect of local injuries. The blow which, in a young man, would have given rise to acute local inflammation and symptomatic fever, will, in the old man, probably induce little more than temporary pain and stiffness, or should inflammation be set up, it will generally be of a subacute character. Thus, the development of the acute form of rheumatism, in advanced life, is rendered improbable, not only by the source and nature of its materies morbi, but by reference to other febrile and inflammatory affections.¹

A parity of reasoning, however, would lead us to anticipate a more constant tendency to the formation of the poison in advanced years, and a more frequent occurrence of symptoms indicating its presence in the system. And such is, indeed, too frequently the case. So common is some degree of mal-assimilation in advanced life, and so constant the tendency to the formation of rheumatic poison, that a greater or less amount of it is almost always present. Its effects are evident on the slightest exposure,

¹ The diminished susceptibility to irritation exhibited by the system generally, is displayed most strikingly in the fibrous textures, the usual seat of rheumatic inflammation. The great Bichât says, " Dans les vieillards, le système fibreux devient de plus en plus dense et serré."

on the slightest exciting cause, for pain ensues, wandering from limb to limb, often fixing on some one in particular, and not unfrequently producing effusion into the joint, with temporary thickening of the tendons in its immediate vicinity. Thus, months will sometimes pass away, pointing with the heavy finger of suffering to the poisoned condition of the circulation. In youth this is very seldom the case. The susceptibility of the system does not long remain unmoved: either the excretory organs are stimulated to throw out the morbid matter; or, if not, the constant presence of an irritant matter, which has accumulated sufficiently to give rise to pain, soon rouses the system to action, symptomatic fever is set up, and ushers in an attack of acute or subacute rheumatism.

Sometimes, however, a person advanced in years does suffer from acute rheumatism, while, on the other hand, a person not yet passed his prime is occasionally tormented with the chronic form of the disease. And the phenomena observed in the cases alluded to, entirely confirm the view I have taken. In the former instances the patient is invariably vigorous for his age, active, and otherwise of a strong constitution,—one, therefore, whose system is still susceptible of irritation, and still prone to set up acute inflammatory action; whilst, in the latter, the poison is either generated in small quantity, as is evidenced by the slightness of the functional disturbance, or the patient is of a sluggish, inactive disposition, and phlegmatic temperament,—one, therefore, whose system is difficult to rouse so as to set up an acute paroxysm of the disease.

I maintain, then, that the liability to rheumatism increases with advancing years; that, in early childhood, it is very uncommon, but, in adult life, one of the commonest and most troublesome complaints which flesh is heir to;

that although the chronic form of the disease rarely appears in the irritable state of the system which occurs in youth, and the acute form seldom arises when the irritability of the constitution is blunted by age, yet that the variety in form depends, not on any difference in the proximate cause of the disease, nor on any difference in the character of the *materies morbi*, but on the quantity of the poison present, on the nature of the constitution to be acted on by it, and on the influence exerted by age and its accompanying changes in the system. Such are the agencies which modify the form which the disease assumes, and the result of their operation will be seen by an inspection of Table III, appended to this Chapter.¹

It has been asserted, that the occurrence of an acute attack of the disease tends to strengthen the disposition to rheumatism. But this is certainly not the case. A paroxysm is evidently but an effort of the constitution, and generally for the time an effectual effort, to get rid of the poison; and it is highly improbable that such an action should tend to perpetuate a diathesis, the effects of which itself is set up to counteract. If such were the case, the victim of a well-developed attack of the disease would inevitably be a martyr to rheumatism for the remainder of his life; whereas the occurrence of a single acute attack is by no means uncommon when exciting causes are subsequently avoided, and the general health is carefully attended to.² Moreover, it is impossible, on such a supposition, to account for the rare occurrence of rheumatic symptoms shortly after the subsidence of a well-developed paroxysm,

¹ See page 43.

² "Enfin quelques exemples preuvent, que le Rheumatisme peut ne se montrer q'une fois dans tout le cours de la vie." (Chomel, op. cit., p. 124.)

and for the long period which usually intervenes between any two acute attacks; whilst, on the other hand, the fact that if the paroxysm be irregular and ill-developed, rheumatic symptoms very commonly remain behind, points very decidedly to the opposite conclusion.

But when once a paroxysm has been fully established, there is too much reason to dread its recurrence at some future period, for it is a certain sign of a tendency to the formation of the rheumatic poison, of the proneness of the system to suffer from its influence, and of its power to set up those actions which constitute acute rheumatism. Moreover, in ordinary cases, but little care is taken, after recovery from such an attack, to guard against a similar invasion in future. The disease is looked upon as the effect of cold; and, therefore, to use the common phraseology, "when it is fairly cured," no treatment is subsequently adopted; no means are taken to improve the general health; the patient having for the time got rid of the *materies morbi*, feels as well, or even better than he had done for weeks or months previously, and, ignorant of the real cause of the disease, is unwilling, even should his medical attendant recommend it, to subject himself to further treatment. Yet this is just the time when medical interference is most effective in correcting that unhealthy state of assimilation on which the existence of rheumatism depends, and which, if not immediately arrested, will probably pass from bad to worse, until it issues again in a paroxysm of the disease.

The class of patients and the sex most obnoxious to rheumatism, call only for a passing remark, as a slight consideration as to the cause of the disease will suffice to point out its more favorite victims. Those persons are naturally the chief sufferers who, through want and privations, irre-

gularity of life, and neglect of their general health, are rendered most liable to that state of mal-assimilation whereby the materies morbi is produced; and who, again, from the nature of their occupations, are most exposed to atmospheric vicissitudes, and to other exciting causes of the disease. Subject to such modifying influences as these, all classes of society and both sexes are almost equally liable to its invasion; but if the question be viewed solely in reference to its actual occurrence, rheumatism will be found more prevalent in the lower than in the upper ranks of society; and in its acute, no less than in its chronic forms, more frequent among men than among women.¹

Climate and season are generally supposed to have a powerful influence over the production of rheumatism. Except, however, as predisposing and exciting causes, it has

	Males.	Females.
¹ Out of 623 patients suffering from rheumatism admitted under my care, at St. George's Hospital, during the seven years ending July 31st, 1855, there were	426	197
Out of 1014 rheumatic patients admitted into St. George's Hospital, under the care of the physicians, during the four years ending December 31st, 1848	666	348
Out of 751 rheumatic patients who came under the care of Sir Gilbert Blane, at St. Thomas's Hospital, ('Med.-Chir. Trans.,' vol. vi)	547	204
Total number of cases 2388, of which	1639	749

Acute Rheumatism.

Out of 289 cases of <i>acute</i> rheumatism admitted into St. George's Hospital during the four years ending December 31st, 1848	151	138
Out of 136 cases of <i>acute</i> rheumatism recorded by Dr. Latham ('Clinical Medicine,' p. 143)	75	61
Total number of cases 425, of which	226	199

been shown already that they can exercise no such power; and the influence they do exert, as proved by experience, is just such as might be expected from the nature of the case. If the disease be dependent on the presence of a materies morbi in the blood, a matter of which the skin is the peculiar emunctory, we should hardly expect it to occur so frequently in summer, when the skin is acting freely, as at that season of the year when cutaneous action is comparatively sluggish. For the same reason we should expect it to prevail chiefly in cold, damp, and variable climates, for when moisture lends its aid to cold in depressing the system generally, and thereby favouring the generation of the poison, as also in checking perspiration, and thus preventing its escape from the system, then we should consider all things favorable for the development of rheumatic symptoms. Now facts are strictly in keeping with these deductions. It is not in the most inclement seasons nor in the coldest climates that rheumatism is most prevalent, but at those seasons and in those climates remarkable for damp and variable weather.¹ The disease occurs less frequently in the frosty month of December, than in the warmer but relaxing weather of May,² and it is not so prevalent in the cold climate of Nova Scotia and New Brunswick as at the Cape of Good Hope, the land of heaths and geraniums.³ It further appears from observa-

¹ See Table IV, appended to this Chapter, p. 44.

² Ibid.

³ Out of 1000 patients admitted into the Military Hospitals in different parts of the world, there are 29 rheumatic patients in Jamaica, 30 in Nova Scotia or New Brunswick, 50 in Great Britain, and 57 at the cape of Good Hope, giving a proportion of less than three per cent. in the two former places, and of five per cent. and upwards in the two latter. The numbers are quoted in Craigie's 'Practice of Physic.'

tions made in India by Mr. Malcolmson, that, in its acute form at least, the disease is very rare within the Tropics, and as we draw towards the poles the symptoms of acute rheumatism are almost unknown.¹

TABLE I.

Table exhibiting the strong hereditary tendency which exists amongst those cases of Acute Rheumatism which are earliest developed. The cases were all admitted into St. George's Hospital between the 1st of January, 1845, and the 1st of May, 1848.

Age.	Total number of Cases.	Hereditary.	Not Hereditary.	Uncertain.	I have no Note on the subject.
Under 15	15	8	6	1	—
15 to 20	58	22	31	3	2
20—25	63	19	36	3	5
25—30	50	13	26	5	6
30—35	22	5	13	1	3
35—40	17	3	8	2	4
40—45	9	—	7	—	2
45—50	9	1	7	—	1
50—55	1	—	1	—	—
55—60	2	—	2	—	—
	246	71	137	15	23

In all the four cases recorded as hereditary, in patients over the age of 35, the disease had manifested itself several times previously; in one, indeed, no less than four times. Two of those who were between the ages of 30 and 35 had experienced two previous attacks, and two others had once before undergone a similar infliction. But

¹ Le Rheumatisme se presente rarement près de l'équateur et des pôles et devient successivement plus commun à mesure qu'on s'éloigne de ces regions, et règne surtout dans les Zones tempérées." (Chomel, op. cit., p. 462.)

even taking the Table as it stands, it exhibits the influence of an inherited predisposition in—

1	out of every 1·9 patients under the age of	15
1	” 2·6 ” ” ”	20
1	” 3·5 ” between the ages of 20 and 30	
1	” 6·6 ” over the age of	30

Mons. Chomel's experience coincides with this. He says, (*op. cit.*, p. 135,) “ Il est bon de remarquer que dans les cas où l'enfance est ainsi atteinte contre la règle c'est presque toujours sous la triste influence de l'hérédité.”

TABLE II.

Table exhibiting the result of various Observations as to the Age at which Acute Rheumatism most commonly occurs.

Of 73 patients admitted into the Hôpital de la Charité, at Paris—

2	were first attacked before the age of	10
35	” between the ages of 15 and 30	
22	” ” ” 30 ” 45	
7	” ” ” 45 ” 50	
7	” after the 60th year.	

(Chomel, *op. cit.*, p. 134.)

In this Table, however, M. Chomel has included both gout and rheumatism, so that it shows too high an average in the later years.

Of 199 patients suffering from acute rheumatism—

8	were between the ages of 10 and 15
180	” ” 15 ” 40
10	” ” 40 ” 55
1	exceeded the age of 55.

(Macleod on ‘Rheumatism,’ p. 152.)

Of 289 patients suffering from acute rheumatism, admitted into St. George's Hospital, during the four years ending December 31st, 1848—

16	were between the ages of 5 and 15
241	” ” 15 ” 40
25	” ” 40 ” 50
7	had passed the age of 50.

In one instance only was the patient under the age of 10. The disease, however, does sometimes occur at a much earlier period of life. I have had under my care, at the hospital, a child only 8 years old, suffering from dropsy and diseased heart, the result of two attacks of rheumatism, one of which occurred at the age of 2 years and 9 months, and the other at the age of 6 years and 4 months; another child, only twenty months old, was brought to me last year (1855), with several of its joints red and swollen from rheumatic inflammation. Dr. Heberden reports "the rheumatism has appeared as early as in a child of 4 years old." Dr. Watson relates, ('Lectures, ed. 1, vol. ii, p. 623,) "I have frequently seen it in children, sometimes as early as the third or fourth year;" and Dr. Davis states, ('Med.-Chir. Review,' for October, 1817,) "several cases of acute rheumatism were admitted in children of 3, 4, 5, 6, and 7 years of age, and upwards."

TABLE III.

Table of 1014 Cases of Rheumatism and Rheumatic Gout, admitted into St. George's Hospital, during the Four Years ending Dec. 31st, 1848, showing the form of the disease, and the age and sex of the Patients.

Age.	Acute Rheumatism.		Subacute Rheumatism.		Chronic Rheumatism, including Sciatica.		Rheumatic Gout.		TOTAL.	
	Men.	Women.	Men.	Women.	Men.	Women.	Men.	Women.	Men.	Women.
5 to 10	1	—	2	—	—	—	—	—	3	—
10—15	4	11	4	3	4	2	—	1	12	17
15—20	22	45	17	10	18	12	3	6	60	73
20—25	37	35	26	10	37	13	8	4	108	62
25—30	31	25	23	12	67	12	5	8	126	57
30—35	15	11	13	9	46	10	9	7	83	37
35—40	15	5	10	4	37	16	10	8	72	33
40—45	9	3	3	4	33	5	12	11	57	23
45—50	11	2	5	1	32	12	14	3	62	18
50—55	2	—	2	—	17	7	6	7	27	14
55—60	3	1	2	—	26	4	8	3	39	8
60—65	1	—	—	—	4	2	2	3	7	5
65—70	—	—	—	—	3	1	5	—	8	1
70—75	—	—	—	—	1	—	—	—	1	—
75—80	—	—	—	—	1	—	—	—	1	—
	151	138	107	53	326	96	82	61	666	348

In this table, however, I am satisfied that many cases are included

under the title of Rheumatic Gout, which ought to have been classified under the head of Gout, for later and more experienced observation has convinced me that many cases of pure Gout occur, which an inexperienced eye is unable to distinguish from Rheumatic Gout, and that true Rheumatic Gout is of far less frequent occurrence in men than the above table would indicate. Subjoined is a table of the last 285 cases of Rheumatic Gout which have come under my care, whether in hospital or private practice.

RHEUMATIC GOUT.						
Age.	Men.	Women.	Age.	Men.	Women.	TOTAL.
5 to 10	—	1	45 to 50	5	24	Men. 52 Women. 233
10 — 15	—	3	50 — 55	3	17	
15 — 20	3	14	55 — 60	—	9	
20 — 25	5	27	60 — 65	1	7	
25 — 30	11	21	65 — 70	—	2	
30 — 35	9	37	70 — 75	—	2	
35 — 40	7	31	75 — 80	—	—	
40 — 45	8	37				

In men, the disease occurs most commonly in sequel of the cachexia, induced by syphilis and gonorrhœa.

TABLE IV.

Table exhibiting the Influence of Season upon the production of Rheumatism.

Out of 623 rheumatic patients, admitted as out-patients, under my care at St. George's Hospital, during the seven years ending July 31st, 1855, there occurred—

In January, 53; in February, 54; in March, 51; in April, 60 = 218
 „ May, 57; in June, 48; in July, 52; in August, 49 . = 206
 „ September, 54; in October, 48; in November, 50; in
 December, 47 = 199

Out of 1014 rheumatic patients admitted *into* St. George's Hospital, under the care of the physicians, during the four years ending December 31st, 1848, there occurred in

	Acute.	Subacute.	Chronic.	Rheum. Gout.	TOTAL.
January .	27	13	44	14	98
February .	27	12	23	10	72
March . .	28	18	36	15	97
April . .	23	15	27	11	76
May . . .	30	14	40	16	100
June . . .	21	10	34	21	86
July . . .	14	10	27	14	65
August . .	16	11	41	9	77
September .	22	16	45	15	98
October . .	27	11	37	5	80
November .	28	19	29	10	86
December .	26	11	39	3	79
	289	160	422	143	1014

CHAPTER III.

ON THE SEAT OF RHEUMATISM.

MUCH difference of opinion has existed among physiologists as to the precise localities or textures of the body, which become the seat of pain and inflammation in rheumatism. Some persons have referred to the muscular structures as the primary seat of the disease, and have maintained that other parts are attacked in consequence of their proximity to those first affected. Some have imagined the tendons to be its primary seat, and some have confined its action to the ligaments, whilst others taking a wider range have given it a choice amongst all the fibrous textures of the body. Some, again, unwilling to recognise its constitutional origin, and unable otherwise to explain the frequent shifting of its local symptoms, have suggested the aponeurotic sheaths and the fasciæ as its seat, and supposing its effects to spread by continuity of surface, have thus endeavoured to explain its attacks on various parts of the body.

Now, looking at the difference in these theories, based as they mostly are upon actual, though not very extended, observation, it might be fairly inferred that no one texture is exclusively the seat of irritation in rheumatism; and the history which has been given of the nature of the disease, borne out by many of its most striking phenomena, completely establishes the correctness of this inference. For if

rheumatic inflammation be due to the presence of an irritating matter in the blood, it is obvious, as all parts of the body are supplied by this blood, and are, therefore, equally exposed to its influence, that all must be more or less liable to suffer. Such is the law respecting the action of poisons in general,¹ and such, in fact, is found to be the case in regard to the rheumatic poison. The joints and the surrounding structures are the parts most commonly implicated; but not unfrequently the pericardium and endocardium, the investing and lining membranes of the heart, become the seat of rheumatic inflammation, and, in some rare cases, the heart itself does not escape entirely unscathed.² The uterus, the kidneys,³ and more rarely the liver, sometimes experience the effect of its irritation, and

¹ "It is seldom that the action of poisons is limited to one membrane, or organ, or system of organs; the greater number of these noxious agents act on two or more organs, or systems of organs." (Dr. Williams 'On Morbid Poisons,' vol. i, p. 4.)

² For cases of rheumatic inflammation and suppuration of the heart, see 'Medical Gazette,' vol. iii, p. 118; a Note to Mason Good's 'Study of Medicine,' vol. ii, p. 153; Dr. Watson's 'Lectures,' ed. 1, vol. ii, p. 287; and 'Trans. of the Pathological Society,' vol. ii.

³ For a remarkable case in point, see Case III, Cap. vii, of this Treatise. I have also seen nine cases in which the urine has become albuminous, for a few days, during the course of acute rheumatism, and two in which I detected blood globules by the microscope. The most remarkable case in point, however, is one which occurred in University College Hospital, under the care of Dr. A. T. Thompson, and which has been recorded by Dr. John Taylor ('Med.-Chir. Trans.,' vol. xxviii). "The urine was not albuminous on the patient's admission, but in a short time it became so highly charged with this principle as to assume a solid form on being heated, and its specific gravity at the same time mounted to 1050. After a few days more no trace of albumen remained, and the urine had assumed its ordinary appearance and density."

the lungs are not unfrequently affected, as is evidenced by the supervention of bronchitis and pneumonia.¹ In some cases active pleurisy supervenes, and more rarely inflammation of the sac of the peritoneum.² The eyes occasionally suffer, as do also the testes, the skin,³ the muscles,⁴ and the periosteum in various parts of the body. Dr. Watson has reported rheumatism of the articulation of the jaw, Dr. Copland and others of rheumatic inflammation of the membranes of the spinal cord, and instances of inflammatory affection of the dura mater are to be found in every work on rheumatism. And other parts are secondarily, even if they be not primarily, implicated, for the cartilages of the joints may inflame and ulcerate,⁵ and even the osseous structures may become involved in the mischief. That such complications would occasionally arise, might have been

¹ For cases in point, see Cap. X, of this work. Latham's 'Clinical Medicine,' p. 161. A Paper by Dr. Wells, in the 'Transactions of a Society,' &c., vol. iii, p. 406. A Paper by Dr. John Taylor, 'Med.-Chir. Trans.,' vol. xxviii, pp. 511—13.

² For cases in illustration, see Case II, Cap. vii, of this Treatise; as also 'Andral's Clinique,' p. 535, and 'Med.-Chir. Trans.,' vol. xxviii, p. 512.

³ Several remarkable instances in point have come under my care in St. George's Hospital, in which the extremities, upper as well as lower, have been covered with a patchy erythematous eruption, resembling erythema nodosum. The same observation has been made by others. Thus my colleague, Dr. Wilson, says—"During the present summer of 1844, two lads, aged 15, fell under my care at St. George's Hospital, in both of whom a red patchy (cutaneous) eruption was associated with the arthritic symptoms of ill-developed rheumatic fever.' (Dr. Wilson on the "True Character of Acute Rheumatism." *Lancet*, 1844, vol. ii, p. 194.)

⁴ See Notes of a case in St. George's Hospital, under the care of Dr. Bence Jones, reported in the 'British Medical Journal,' Jan. 10, 1857.

⁵ See Case XVI, Cap. vii, of this Treatise.

expected, *à priori*, from the general distribution of the cause of irritation, and the severity of the local symptoms induced; and, though many of these complications are happily of rare occurrence, and are seldom, if ever, met with in otherwise strong and healthy subjects, yet to deny their existence is to disregard facts which are fully confirmed by experience.

But not only does the rheumatic virus obey the general law of poisons, in that its action is not limited to any one texture or organ of the body, it further resembles this class of agents in displaying a partiality for a particular texture, and particular organs upon which it fixes in preference to others. Such a texture is the white fibrous tissue, which enters into the formation of the aponeurotic sheaths, the fasciæ, the capsules of the joints, the ligaments and tendons, and the fibrous-serous membranes in various parts of the body. The parts, therefore, most commonly affected, are the joints and their surrounding structures, the valvular apparatus of the heart, and the fibrous-serous covering of the heart, the strong white glistening sac of the pericardium.¹

¹ Dr. Law observes that the endocardium, more especially that part of it which is usually the seat of rheumatic inflammation, has its corresponding anatomical elements in the structure of the joints; the lining membrane of the valves is analogous to the synovial membrane of the joints, and the fibrous tissue which enters into their composition to the tendinous structures which enter into the formation of the joints. So also the pericardium exhibits, in its compound constitution, its serous lamina corresponding to the synovial membrane, and its fibrous lamina to the fibrous elements of the joints. To the mitral valve having so much more of this fibrous structure in its composition than the sigmoid valves of the aorta, he would ascribe its being so much more frequently the seat of rheumatic inflammation than they are. (See 'Dublin Med. Journal,' vol. xvi.)

The reason of this predilection of the rheumatic poison for the fibrous and fibro-serous textures throughout the body, is not at first sight obvious, nor, indeed, after careful consideration, can we assign to it other than a conjectural cause. But it is worthy of note, that the textures most commonly implicated in rheumatism, are all examples of the albuminous and gelatinous tissues, from the decomposition of which, in the wear and tear of the body, are formed those secondary organic compounds, the lithic and lactic acids, with which gout and rheumatism are intimately connected. And as it is but consistent with our knowledge respecting the processes of nutrition and assimilation, to suppose that each tissue selects from the blood, and appropriates to itself such matters as correspond with it in chemical constitution, we may readily conceive that some peculiar attraction may be exerted by the fibrous and fibro-serous textures for compounds, such as the lithic and lactic acids, to which they bear so strong an affinity.

There are some curious facts in connection with this subject which require particular notice. It has long been observed, not only that the joints and the surrounding structures are particularly liable to be affected by rheumatism, but that some joints are more prone than others to be attacked. Those joints, for instance, which are most exposed, as the knees, the feet and the ankles, the wrists and the hands, are the parts most commonly implicated: next in order, perhaps, follow the elbows, and then the shoulders and the hips. The larger joints suffer more frequently than the small, and the small joints of the hands and fingers more commonly than those of the feet.

Those joints, again, which have been the seat of local mischief, are more than ordinarily apt to suffer. Thus, a man falls down and sprains his ankle or his knee, and after

a time, with care and attention, he entirely regains the use of the part, and experiences no inconvenience from his injury. But if he is afterwards attacked by rheumatism, the joint which had been formerly injured is almost certain to be affected, and will be so in every subsequent attack, and in all probability it will be the very part in which the earliest local symptoms are manifested.

The same holds good in regard to those parts which are chiefly exercised, more especially when the exercise has been violent and long continued.¹ Blacksmiths, for instance, who wield a heavy hammer, very generally suffer most in the joints of the arm; washerwomen in the joints of the hands and fingers; gardeners, and others accustomed to digging or stooping, are exceedingly liable to lumbago and sciatica; and postmen, and others much employed in walking, are peculiarly subject to rheumatism of the legs. In all these cases the nutrition of the parts affected is unusually exalted, their power of attracting and separating from the blood such matters as correspond with them in chemical constitution is proportionably increased, and hence the reason of their being affected prior and in preference to other parts of the body.²

Another fact to which especial attention was first directed

¹ This fact, I believe, was first pointed out by Cruveilhier.

² May not this be the true explanation of the fact, that the pericardium and endocardium suffer more frequently than do the fibrous membranes in other parts of the body? The dura mater, for instance, firm in its attachments to an unyielding structure, is not exposed to any special cause of excitation, whereas the heart is necessarily in a state of great excitement, its investing and lining membranes are consequently subjected to increased tension and increased friction, their nutrition is proportionably exalted, and everything therefore is in a state to favour the irritative action of the rheumatic poison.

by Dr. W. Budd, of Bristol, is, that, *cæteris paribus*, corresponding parts of the body are similarly affected. If one knee is attacked, it is probable, that ere the close of the disease, more particularly if of long duration, the other will become implicated in the mischief: if one wrist suffers, the other will eventually suffer also. Nor is it strange if the local affection be due to the irritative property of any matter in the blood, that parts which correspond in function and organization, and are equally subjected to the same cause of irritation, should suffer equally and in a similar manner. It is only surprising that any one should hesitate to assign a constitutional origin to a disease presenting features so strongly indicative of a poisoned condition of the blood.

Whatever the part of the body attacked, the aspect of rheumatism varies greatly in different cases. Sometimes the disease is acute; sometimes mild, both in its local and constitutional symptoms; at one time some part of the body is affected, which at another, perhaps, remains unaffected throughout. Hence has arisen the division of rheumatism into several different varieties. Strictly speaking, any division must be necessarily incorrect, inasmuch as, however varying in the locality and intensity of their symptoms, all forms of the disease may and do constantly pass the one into the other, and nothing has been hitherto ascertained as to their pathology to justify such a separation. But, doubtless, pathological differences do exist, though they have as yet eluded our research, and practically there is much advantage in adopting some artificial arrangement. Not only do the different varieties occur under different circumstances of age, sex, constitution, and the like, but they require treatment differing widely in its character. Hence it becomes expedient to make such prac-

tical distinctions as are calculated from their simplicity to facilitate the description of the various modifications of the disease, and those which I propose to adopt are, 1st, acute rheumatism, or rheumatic fever;¹ 2d, rheumatic gout;² 3d, chronic rheumatism; 4th, neuralgic rheumatism.

Acute rheumatism, as its name imports, is characterised by symptoms of active disease. It is generally ushered in by a smart attack of fever, accompanied by a quick bounding pulse, a foul tongue, loaded urine, profuse, acid, sour-smelling perspiration, and wandering pains in the limbs. After a period of varying duration, the pains fix on one or more of the larger joints, which become hot, red, and swollen, and exquisitely tender on pressure. Unlike inflammation arising from truly local causes, this rheumatic inflammation shifts repeatedly, and oftentimes rapidly, from joint to joint, displaying in each great apparent intensity yet rarely producing permanent mischief, so that the joint

¹ Some persons cavil at the term, acute rheumatism, and urge the invariable adoption of the term rheumatic fever, as pointing to the constitutional character of the disorder. But the fever which accompanies acute rheumatism is one only out of many remarkable symptoms which characterise a well-marked attack of the disease: moreover, the term "fever" is more or less applicable to all the modifications of the disease, inasmuch as some functional disturbance exists even in the mildest cases. Therefore, unless the term "rheumatic fever" be applied indiscriminately to all forms of the complaint, which would lead to endless confusion, it appears to me better to adopt a nomenclature which does not involve a question of origin, rather than by any title to impute a functional character to one form of the disease and by inference deny it to another.

² By Dr. Macleod, these cases were classed with true rheumatism, under the title of synovial rheumatism; but I believe they will be found to have a special pathology, and to be totally distinct from rheumatism and gout. I therefore propose to consider them under the common and significant title of Rheumatic Gout.

which to-day seems to threaten suppuration, may to-morrow evince no mark of the violent invasion it has undergone. Sometimes the swelling extends a considerable distance from the joint itself, and is evidently chiefly external to the articulation, for there is a puffiness about the parts affected, and the hollows and depressions in the vicinity of the joints are filled up by effusion into the cellular tissue. At others, the inflammation is less superficial; there is less redness, and the swelling, which is more defined and limited in extent, is evidently due in great measure to inflammation of the synovial membrane with effusion of fluid within the joint, for the distended capsule projects at those parts where the surrounding tissues offer least resistance. In most instances the two varieties of swelling are intimately blended, the diffuse fibrous symptoms predominating at one period of the disease, the synovial symptoms at another; but in proportion as the synovial symptoms become more prominent, and the diffuse fibrous symptoms less marked, so does the case assume more and more the character of that form of disease which I purpose describing under the title of Rheumatic Gout.

From first to last the disease may run its course without the implication of any internal organ; but not unfrequently it is accompanied by inflammation of the investing or the lining membrane of the heart, as also by inflammation of the lungs or pleuræ.

The second variety presents some of the characters of gout more or less blended with those of rheumatism, but is, nevertheless, essentially distinct from the one and the other. It seldom occurs in early life, except when there is a taint of gout or rheumatism in the system; it is not accompanied by the profuse sweating of rheumatism, and does not involve the heart or its membrane. The

articular inflammation is sometimes confined to one or two joints, very generally affects the smaller joints, is almost wholly within the capsule, or the bursæ or sheaths of tendons in its vicinity, is much less migratory than in true rheumatism, is marked by less extended redness, and is accompanied by less active symptoms of fever. But it is more obstinate in its continuance, more apt, when in an acute state, to induce disorganization of the joints, more prone, even in a less active form, to give rise to permanent thickening and enlargement, and often to frightful and irremediable distortion.

In chronic rheumatism, the pain is often referred to the muscular structures, and is probably seated in the muscles themselves, their tendons and fasciæ: very little, if any, redness or swelling is produced, but the affected parts are stiff and painful, and the pain is aggravated by motion or pressure. Sometimes, however, in cachectic states of the constitution, the pain is referred to those parts where the bones are thinly covered by integument, as on the shafts of the long bones, on the sternum, the clavicle, and the cranium; and if the seat of pain be carefully examined, there will be found a rough irregular swelling, tender on pressure, arising from thickening of, and effusion under, the periosteum in that situation. Sometimes, again, the joints are more or less affected: they are stiff and painful, and present some slight and temporary tumefaction, but they are not red, and are seldom tender on pressure, as are the inflamed joints during an acute attack. The local symptoms are migratory, though usually less so than in the acute form of the disease; there is not much sweating, the urine is seldom loaded, and the tongue is not greatly coated; in short, there is far less constitutional disturbance than in the acute form of the disease.

In the fourth species the pain is usually well-defined, and appears to follow the course of particular nerves, more especially those supplying the face and the inferior extremities. The seat is probably the sheaths of the nerves, which are either simply irritated by the rheumatic poison, or else undergo actual inflammation, accompanied by effusion and consequent pressure on the nerves themselves.

CHAPTER IV.

ACUTE RHEUMATISM, OR RHEUMATIC FEVER.

ONE of the commonest and most severe disorders to which the inhabitants of this country are liable, is that known as acute rheumatism, or rheumatic fever. Formidable as well from the intensity of the fever as from the agonising pain of the limbs which it occasions, it is rendered peculiarly fearful and distressing by the consequences to which it frequently gives rise. For the heart is often damaged by the violence of its attack, and becomes inapt for the purposes of the circulation, and when this is the case, the mischief gradually increases, until it issues in palpitation, dyspnœa, and dropsy. Thus not unfrequently, in the prime of life, the unhappy patient falls a victim to a disease of which the seeds were sown, perhaps, years before, during an invasion of articular rheumatism.

Acute rheumatism is usually met with between the ages of 15 and 50, few cases occurring before, and as few after that period of life. It is frequently hereditary, occurs in nearly equal proportion among men and women, and shows itself pretty uniformly throughout the year.¹ At whatever

¹ For statistics and full particulars on these subjects, see Cap. II of this Treatise, pp. 39—44.

age it makes its appearance it presents great diversities in its mode of attack. It may commence without previous notable derangement, either general or local: the patient may consider himself in tolerably good health, when, on exposure to cold, or to some less obvious exciting cause, he is suddenly seized with aching pain and stiffness in the limbs. This gradually increases in severity, and in the course of a few hours, sometimes within a shorter period, is accompanied by redness and swelling, and tenderness of the joints, as also by symptoms of constitutional disturbance.

In another case the attack may be ushered in by febrile excitement, marked by all the characteristic features of rheumatic fever, yet unaccompanied by pain or the slightest articular redness or swelling, and sometimes the disease may even run its course unattended by pain or local inflammation. More commonly, however, after a certain period, pain and inflammation make their appearance. In most instances the joints and the surrounding structures are the parts which first give evidence of irritation, but in some few cases, the heart or its membranes are affected for some time prior to the setting up of articular mischief.¹

In another, and by far the largest, class of cases, the patient presents symptoms of functional derangement long before the full development of the disease. Though not actually feverish, he is evidently "out of sorts;" he feels chilly, languid, and uncomfortable; is unusually sensitive to atmospheric vicissitudes, and from time to time, experiences pain, or threatening of pain, in the limbs. His friends probably observe that his temper is irritable, his appetite capricious, and that he is unwilling to exert him-

¹ See Cap. VI of this Treatise, *Note* on p. 141.

self as much as usual, and if pressed to give an opinion on the subject, they will say he looks pale and far from well. The complexion is sallow and unhealthy, the eyes are dull, and the conjunctivæ yellowish. The pulse, perhaps, is hardly above the natural standard, but the tongue is white or coated, he has a sour disagreeable taste in the mouth, the urine is high coloured and often turbid, and the bowels are irregular or sluggish in their action.

This is the preliminary sickening for the attack. Up to this point the patient feels so little indisposed that he seldom has recourse to medical advice. He fancies "he has caught cold," and comforts himself with the idea that "it will soon pass off." But the pains in the limbs become more constant and severe; he finds it difficult to move, as every attempt at motion aggravates his suffering; and thus he goes on, until he is chilled by sitting in a draught, by getting his feet wet, by sleeping in damp sheets, or by some similar circumstance, when a fit of shivering occurs, unequivocal febrile symptoms declare themselves, articular inflammation commences, and he is obliged to take to his bed. Then he discovers the folly of neglecting the advice of Ovid, who says:

*"Principiis obsta; sero medicina paratur
Cum mala per longas invaluere moras—"*

When once a paroxysm is fully established the patient presents a pitiable spectacle of helpless suffering. He is exceedingly restless, yet lies motionless on his back, unable to stir, afraid to allow himself to be moved by his attendants, and in constant dread, when they approach his bed, lest, by some accidental pressure, they should aggravate his already agonizing pain. Even the weight of the bed-clothes is too much for him, and he generally asks to be relieved from their pressure. His expression portrays

the suffering he is enduring, and indicates, at first sight, the severity of the disease. Yet his aspect differs very remarkably from that of a person labouring under continued fever. It is not so dull, heavy, and depressed; neither is there the same flushing and suffusion of the face; nor the like dry burning heat of skin. Indeed, the countenance is seldom much depressed, the face is usually pale and sallow, and though the skin is sometimes hot and dry, it is more commonly bathed in profuse acid perspiration, which stands in large drops upon the chest, and forehead, and emits a peculiar, sour, disagreeable odour, eminently characteristic of acute rheumatism. The tongue is moist, but coated with a deep white or yellowish white fur, and the saliva, which in health is alkaline or neutral, becomes decidedly acid. The bowels are generally costive, and when acted on by medicine, the evacuations are dark coloured and offensive. The urine is scanty, dark coloured, and of high specific gravity, extremely acid, and loaded with lithates, which are deposited as a copious, red, brickdust sediment.¹

¹ At the outset of the disease, the high specific gravity of the urine is due to a relative, rather than to a positive, increase in the quantity of the matters excreted by the kidneys. The solid constituents of the urine are not in excess, but the quantity of water is far below the average. In two cases I have found the urine abundant, pale, alkaline, and turbid, containing crystals of the ammonio-magnesian phosphate. In both instances, the patients were weakly, and their perspiration was of a peculiarly acid nature. Something of the same sort has been remarked by others (See Simon's 'Chemistry,' vol. ii, p. 275). Occasionally, when there is much renal irritation, the urine is slightly albuminous, coagulating by heat and nitric acid, and a few blood corpuscles may then be discovered in it by the aid of the microscope; but usually, a few scales of epithelium, together with an amorphous deposit of lithates, and here and there a few crystals of lithic acid, or of oxalate of lime,

The pulse is accelerated, varying in frequency from about 90 to 130 in a minute, and is full and bounding to a degree seldom observed in any other disorder. The appetite varies; it is generally impaired, but occasionally almost as good as usual; and thirst, though sometimes excessive, is not usually an urgent symptom. From first to last, if the case be not complicated by some internal affection, the head usually remains clear, the intellect unobscured; there is no headache, no delirium, neither is there subsultus tendinum, nor other evidence of the disturbance of the nervous centres which is commonly met with in continued fever. But the pain precludes the possibility of sleep; and, before the disease has run its course, the patient is exhausted and becomes irritable and fractious.

The local symptoms of the disease are equally striking and peculiar. At first they consist of little more than pains wandering capriciously from limb to limb, and producing more or less temporary stiffness. But when the attack is more fully established, the pains, though shifting from one spot to another, until few parts of the body have been left free from invasion, fix more particularly upon the larger joints.¹ These rapidly pass into a state of inflammation, and become hot, red, and painful, as also tender

are alone observed on a microscopic examination. Minute crystals of lithic acid are also found sometimes in the pellicle, which forms on the surface of the urine.

¹ Other parts of the body besides the joints, are liable to become the seat of pain in acute rheumatism. Such, for instance, are the loins, the neck, the scalp, and the parietes of the chest and abdomen. Affection of these parts, however, is not so common in the acute, as in the more chronic forms of the complaint; and I shall therefore defer entering upon their consideration until I speak of Chronic Rheumatism.

to the touch. After the lapse of a few hours effusion takes place into the adjacent cellular tissue; the hollows and depressions about the joints are obliterated; and the surrounding skin, which had been hitherto moist and perspiring, becomes dry, tense, and shining; so much so, indeed, that experience alone enables us to predict that suppuration will not take place.

Sometimes, however, the parts present a somewhat different aspect. The articular swelling is more circumscribed and in its form and character indicates the existence of effusion within the joint rather than into the surrounding tissues. There is less superficial redness and swelling, but there is evident fulness and distension of the synovial membrane, which bulges at those parts where the surrounding tissues offer least resistance, forming a swelling in which fluctuation is perceptible. These two varieties of swelling are usually more or less intimately blended, the synovial symptoms predominating at one period of the disease, the diffuse fibrous symptoms at another. But in proportion as the latter are absent and the former are more strongly marked, so does the case lose the characteristics of true rheumatism, and assume those of the disorder, which I purpose describing under the title of Rheumatic Gout.

A remarkable feature of the articular inflammation, is its migratory nature. In the course of a few days, nay sometimes within a few hours, the enemy begins to shift his quarters, and joint after joint undergoes in turn the infliction of his terrible visitation. The knee, which to-day is red and swollen, may to-morrow present no trace of mischief, while the wrists, the elbows, the ankles, or the knuckles, which have been hitherto free from pain, may in a few hours become the seat of inflammation. Moreover, after evacuating its first position and invading several joints

successively, inflammation not unfrequently recommences in its old quarters, and the parts go through the same series of changes to which they had been previously subjected. In some instances, however, the parts first affected remain so throughout the attack; and it will be observed, that the obstinacy and fixity of the inflammation very generally vary in an inverse proportion to the number of the joints implicated.

The subsidence of inflammatory action at one part, and its commencement at another part of the body, appear sometimes to be simultaneous actions, but more commonly the mutual dependence of these phenomena is by no means clearly marked. A fresh joint may be, and constantly is, attacked without any decrease in the activity of the inflammation observed in the parts primarily affected, and even when a diminution of action is perceptible, it usually occurs slowly and imperfectly, and the parts first attacked remain for some days tumid, painful, and tender. So that, in many cases at least, the fresh inflammation set up is obviously a mere extension of the disease.

Rheumatic inflammation, whatever its character and apparent intensity, very generally subsides, without the supervention of the ordinary ill effects of inflammatory action.¹ Sometimes, indeed, as I shall presently point out, the joints do go on to suppuration; but more commonly the redness and swelling disappear, the skin again becomes flaccid, and gradually resumes its perspiratory function; and thus throughout the whole course of the disease, a series of local changes is kept up, which seldom leave any

¹ I here allude only to the articular inflammation, for when the heart, the lungs, or the pleuræ are attacked, the ordinary products of inflammatory action are almost invariably produced.

permanent ill effects, though varying greatly in the rapidity of their occurrence, at one time occupying a few hours only, and at another several days, in their completion.

A considerable increase in the severity of the pain and some exacerbation of the febrile symptoms, is usually observed towards evening, whilst, as morning advances, the unhappy patient again experiences some remission of his sufferings. These curious alternations have been attributed by some to mere variations in the external temperature; and the oft-cited fact that the pains of rheumatism are sometimes aggravated by heat has been confidently appealed to in support of this doctrine.¹ But it matters not at what temperature the air of the room be kept, nor whether the heat be increased or decreased, as it always may be by artificial means, the periodical exacerbation in the severity of the symptoms is still observed, and cannot be prevented; and the most rational interpretation of this peculiarity, which obtains even in diseases which are benefited by warmth, is that probably which ascribes it to some obscure influence connected with the diurnal revolution.

One of the most remarkable and suggestive facts in regard to rheumatism is, that the fever and constitutional distress are not necessarily commensurate with the extent and intensity of the local symptoms. Not only is rheumatic inflammation of the joints very frequently *preceded* by febrile disturbance, but sometimes the fever runs so

¹ That heat does occasionally aggravate rheumatic pains is a fact which does not admit of doubt, but it does so most strikingly, when it fails to produce free cutaneous action. I have constantly observed, that those who have complained most of the increase of pain induced by warmth, are loudest in their praises of the benefit accruing from profuse acid perspirations.

high before any local symptoms have been established, as to cause even careful and intelligent practitioners to mistake the nature of the impending attack. Moreover, when febrile symptoms do thus precede the establishment of local inflammation, they are not only not increased by its occurrence, but, as was remarked by the sagacious and observant Sydenham,¹ they are generally relieved, the pulse becoming calmer, the countenance less anxious, and the patient altogether easier.

Another point to be observed is, that the pain is not proportioned to the redness and swelling, or in other words, to the apparent intensity of the local inflammation. The pain may be most severe, and, indeed, generally is so, just before the redness and swelling commence, and, occasionally, subsides in some measure when these external evidences of inflammation present themselves. Moreover, it is usually less severe when much effusion takes place into the surrounding tissues, giving rise to a certain extent of œdema, than when the parts are only slightly swollen, but are exceedingly hot, with the adjacent skin of a dusky, lurid red colour. This I believe to be due to the fact, that in one set of cases the superficial parts are chiefly affected, in the other the ligaments and more deeply-seated structures, which are dense and unyielding in their nature. The former cases are accompanied by pain of a burning and pricking character: the latter by a sense of gnawing or tearing. In the first-named instances the local symptoms are more migratory, and shift their position more rapidly and more completely than in those last mentioned, in which, for some days after all swelling has subsided, there still remains considerable stiffness about the parts,

Sydenham 'Opera,' sect. vi, cap. v.

the result probably of thickening in the sheaths of tendons, and in the various tissues connected with the joint.

The profuse perspiration, characteristic of acute rheumatism, is commonly spoken of as "wasting and enfeebling," and is said to distress and weaken the patient without alleviating his suffering or shortening its duration. This opinion, however, is erroneous, and a mistake of some practical importance. True, the perspiration is often excessive, generally disagreeable, sometimes even distressing to the patient, and fails in affording immediate relief. But if it be checked for a time, if the outlet by which such enormous acid secretions are making their escape be closed, it will require no very accurate observation to mark the consequent increase in the severity of the symptoms. The pains rapidly become worse, the constitutional disturbance more striking than before, and the sufferer himself will soon observe that he is easier and less oppressed when the skin is perspiring than when it is perfectly hot and dry. Some cases there are which, for a time at least, are unaccompanied by the characteristic sweats, and in these the pains are always excessive, and the constitutional symptoms most severe; nor is any relief obtained until, by the use of proper means, the skin's action is established and perspiration commences. The *materies morbi* is in great measure got rid of, and the natural cure of the disease effected by means of these profuse, sour-smelling perspirations; and unless they be replaced, as they sometimes are, by diarrhoea, diuresis, or extremely acid vomiting, everything which tends to check them, tends also to protract the disease. In the wards of St. George's Hospital I have had repeated opportunities of noting this fact, and have frequently begged the pupils to observe, that the cases of rheumatic fever which have progressed most favorably,

which, though severe in their local and general symptoms, have run their course in a fortnight or three weeks, and have left the patient free from pain, have been those accompanied by profuse acid perspirations; whilst those which, in spite of medical treatment, have lingered on for a period of six or eight weeks, have been those in which the sweating has been less strongly acid, less perfect in its development, or less constant in its continuance, taking place over a portion only of the body, or occurring profusely perhaps for two or three days, and then subsiding or altogether disappearing. Indeed, such cases have usually continued until the great accumulation of the poison in the blood, with the consequent increase in the severity of the symptoms, both general and local, have seemed once again to stimulate an attempt at this system of relief. But I would not be misunderstood on this subject. Though the characteristic acid, sour-smelling perspirations, which occur in the natural course of the disease, are unquestionably highly beneficial to the patient, as is shown by the increased severity of the symptoms which results whenever they are forcibly arrested, those certainly are not so which are met with in debilitated or cachectic states of constitution; which occur after the incautious use of the vapour bath, or depletion carried to an unwarrantable extent; or which again are sometimes witnessed towards the close of protracted cases. Such perspirations are useless, wasting, and enfeebling: though almost as profuse, they emit but little of the characteristic odour; they may be somewhat acid, but not highly so as before; they are not attended by the same heat of skin, by the same full and bounding pulse, nor by an equally loaded state of urine, but, on the contrary, are accompanied by a soddened state of skin, by a soft, weak, irritable pulse, and not unfre-

quently by an eruption of sudamina. The former are essential to the safety of the patient, the latter are, in great measure, the effect of debility, are enfeebling and pernicious in their continuance, and can and ought to be arrested. This distinction may be easily verified by careful observation, and it is the more important, because any misunderstanding on the subject might lead to an erroneous system of treatment; to the forcible repression of perspiration, on the one hand, or to its inordinate promotion, on the other.

When the disease begins to subside, there is generally a marked change in the character of the symptoms: the pain becomes less constant and less intense, the redness and swelling gradually disappear, the frequency of the pulse subsides, the tongue begins to clean, the evacuations from the bowels become less fetid and less dark coloured, the perspiration less profuse and less sour-smelling than before, and the urine more abundant and less loaded with lithates. Many of these changes, however, are not observed until the disease is obviously on the decline; and, perhaps, the only means by which it is possible to anticipate a speedy subsidence of the symptoms, is by noticing the condition of the tongue and urine. The former, when the disease is about to yield, begins to clean, and becomes less red at the tip and edges, whilst the latter drops its sediment, becomes more abundant, and contains a larger quantity of salts, so that it retains its high specific gravity, notwithstanding the increase in the amount of water. Under the microscope, however, no difference can be detected in the urinary deposits at the various stages of the complaint.

After a well-developed paroxysm of the disease uncomplicated by any internal affection, recovery is usually complete, and the patient soon regains his former vigour. But in cases in which the symptoms are ill-developed, or which

occur in strongly predisposed persons, or in cachectic states of system, a subacute or chronic form of rheumatism is apt to succeed the more active symptoms of the disease. Either the materies morbi is not fully got rid of, or the function of assimilation being still imperfect, fresh poison is generated, *de novo*, in the system. Pains consequently occur, which wander from one part to another, and occasionally are attended by some amount of articular swelling. In most instances these pains gradually subside, and with them the tendency to swelling of the joints; but in others they continue for several weeks, and do not ultimately disappear until an acute paroxysm of the disease has been re-established, and the poison through its means thoroughly eliminated.

Sometimes, after all febrile and inflammatory symptoms have passed away, there remains a tenderness and aching of the joints, which, during the attack, have been the seat of inflammation. This must not be mistaken for the subacute or chronic form of the disease just alluded to, as it is, doubtless, referable not to any persistent cause of irritation, but to the morbid condition in which the parts have been left. The ligaments, tendons, fasciæ, and aponeurotic sheaths, have not recovered their normal condition; they are thickened and less elastic than they ought to be, and the bursæ are distended by an unnaturally thick fluid, and thus the parts are rendered stiff and inapt for motion. In acute fibrous rheumatism this is less frequently the case than in that form of the disease which sometimes has been called synovial rheumatism, but which I purpose describing under the title of Rheumatic Gout. When it *does* occur, it may be distinguished from chronic rheumatism, by the dull aching nature of the pain itself, by the absence of pain when the parts are at rest, by the freedom from pain

in other parts of the body, and by there being no evidence of constitutional derangement.

The duration of an ordinary uncomplicated attack of acute rheumatism, has been variously stated by different writers. Dr. Warren reported six weeks as its ordinary duration; Sir Charles Scudamore stated that "in a case of which the issue is favorable, the fever and pains are brought to a close at the end of the third week, and in slighter attacks at an earlier period; but that when the course of the disease is untoward, a period of two months scarcely serves to exhaust its power of producing even acute symptoms."¹ M. Chomel's experience led him to believe that four weeks is about the average period for arriving at convalescence, and that recovery never takes place before the twentieth day;² and Dr. Macleod imagined that, "with the common methods of treatment, probably five or six weeks may be about its average duration."³

My own observation has led me to believe that, even when unattended by any internal affection, the disease, under *ordinary* methods of treatment, endures very generally from four to five weeks, and under unfavorable circumstances may be indefinitely protracted. Of the 246 cases admitted into St. George's Hospital, under the care of the physicians, during the time I held the office of medical registrar, the great majority were decidedly convalescent about the end of the fourth or the beginning of the fifth week from the commencement of the attack, and were

¹ On 'Rheumatism,' p. 25.

² "Le rhumatisme articulaire aigu quelque soit la medication employée ne se termine jamais avant le vingtième jour." ('La Lancette Française,' August, 1834.)

³ On 'Rheumatism,' p. 25.

ready to leave the hospital about the end of the sixth week.¹ And of 23 other cases, part of which I noted in the Hôtel Dieu, at Paris, and part at Addenbrooke's Hospital, at Cambridge, considerably above one half were of about the same duration. Experience, however, has taught me to believe that remedial agents are capable of still further shortening its duration; and to such an extent does this hold good, that, as I hope to show, the average duration of an uncomplicated attack may be reduced, by judicious treatment, from a month or five weeks, to ten days or a fortnight. This, too, is the conclusion arrived at by Dr. Garrod, who, since the publication of the first edition of this work, in 1852, has in great measure adopted the same principle of treatment as was therein recommended.²

But the question arises as to whether acute rheumatism may not be immediately arrested by treatment. Dr. Macleod and many other practitioners have maintained, not only that the paroxysm may be shortened, but that it may be cut short, if treated vigorously at first. My evidence, however, if given relative to the methods of treatment hitherto pursued, must be in opposition to this pleasant theory. Whilst I was following the practice of Messrs. Chomel and Rostan, at the Hôtel Dieu, at Paris, I paid great attention to all the cases of rheumatic fever; I have watched with equal care the cases admitted into the wards of St. George's Hospital during the greater part of the last ten years; and in my own practice at the hospital and in private life, have tested the different modes of treatment under which this favorable result is said to have been obtained; but it has not been my lot to witness the results ascribed by different gentlemen, each to his own particular remedies. Doubtless, instances are occasionally met with in which the disease

¹ See Table, appended to this Chapter, p. 74.

² See 'Med.-Chir. Trans.,' vol. xxxviii, p. 148.

subsides rapidly under treatment, but such examples are rare, and in my observation have occurred indifferently under all remedies. The favorable result is referable probably to some change induced in the functions of assimilation, by agencies altogether beyond our ken, and with ordinary treatment it occurs so seldom, that it cannot be fairly cited as indicating the possession of a power to arrest the disease.

With regard to the great majority of such cases, another very simple and obvious explanation is applicable, namely, that the duration of the disease is reckoned from the first commencement of the treatment, and not from the actual beginning of the attack. I have seen several patients recover within four or five days after admission into the hospital, but in three cases only, under the usual methods of treatment, have the symptoms been thoroughly subdued within fourteen days from the commencement of the attack. In almost every instance of a supposed rapid cure, investigation has shown the attack to have commenced some ten days or a fortnight prior to the patient's admission into the hospital, a sufficient explanation of the marvellous rapidity with which the symptoms have subsided. This, however, does not hold good in regard to cases treated after the plan I have recommended; for by this method the disease may be generally arrested within a week, at whatever period of the attack the treatment may be commenced.

I have hitherto alluded solely to well-developed and uncomplicated cases of acute rheumatism, and the remarks already made, both as to the symptoms and duration of the attack, apply to such and to such alone. The disease, however, is often protracted, and rendered formidable by various complications. One, which is observed chiefly when catarrhal affections are prevalent, is inflammation of the lungs or their investing membrane, excited no doubt by the same cause of irritation as gives rise to the articular

symptoms, but arising at one season more than at another, in consequence of the poison being determined to the lungs, by the prevalence of an epidemic influence. Case after case of acute rheumatism has been admitted into St. George's Hospital complicated by this most alarming affection, and among 136 cases recorded by Dr. Latham, it was met with in no less than 24 instances. Moreover, in every instance in which the case issued unfavorably, either pleurisy, pneumonia, or bronchitis, was present.¹

Another, and sometimes a serious complication of acute rheumatism, is inflammation of the eye, generally of its sclerotic coat.² The proportion of patients in whom it occurs is extremely small, and it seldom arises except where there has been some cause of irritation to the visual organs, and where, therefore, the poison of rheumatism has been specially determined to the irritated part. In no instance have the articular symptoms appeared to be relieved by its occurrence, and I have, therefore, been led to regard it as a mere extension of the disease.

Another and most frightful complication of rheumatism, is inflammation of the brain, or its investing membranes; another is active maniacal delirium, sympathetic of inflammation of the heart or lungs, or of the vitiated condition of the circulating fluid; and another is suppuration, or gradual disorganization of the articular structures. These happily are also rare occurrences.

¹ Latham's 'Clinical Medicine,' pp. 164-5.

² Since the publication of the first edition of this work I have seen reason to doubt whether inflammation of the eye is ever a consequence of true rheumatism. Indeed the conviction has been forced upon me that, when it occurs during the progress of articular inflammation, which is not of a gouty nature, the coincidence is merely accidental; or else that the primary disease is "gonorrhœal rheumatism," which is doubtless referable to a specific poison, and has no connexion with true rheumatism.

The most frequent, the most dangerous, and in its consequences the most distressing complication of acute rheumatism, is inflammation of the heart and its membranous envelopes. This merits the most anxious consideration of every one interested in the safety of a rheumatic patient; and when discussing the various complications of acute rheumatism, I shall enter fully into its history, symptoms, and treatment.

TABLE

Exhibiting the Number of Cases of Acute Rheumatism, admitted into St. George's Hospital, in each month of the four years ending December 31st, 1848, and marking the average length of time they remained in the Hospital. The great majority of these Patients had been ill from five to ten days prior to their admission into the Hospital.

	Number of Patients.	Average length of time in the Hospital.
		Days.
January . . .	- 27	38
February . . .	27	28
March . . .	28	37
April . . .	23	32
May . . .	30	28
June . . .	21	43 ¹
July . . .	14	37
August . . .	16	54 ²
September . . .	22	31
October . . .	27	32
November . . .	28	33
December . . .	26	28 ³
Total . . .	289	Aver. 35

¹ The average of June is rendered unusually high by the occurrence of 1 case of 170, and 1 of 144 days' duration.

² The average of August is abnormally raised by the occurrence of four cases of the respective duration of 70, 84, 99, and 119 days.

³ The average of December is reduced by the occurrence of two deaths within a few days of the patients' admission, and by the cure of 1 patient in 11 days. This patient had been ill three weeks prior to admission.

CHAPTER V.

ON THE TREATMENT OF ACUTE RHEUMATISM, OR RHEUMATIC FEVER.

IF the contradictory nature of the treatment recommended for the cure of acute rheumatism be taken as a test of its obstinacy and intractability, it certainly is the most tedious and intractable of diseases. By some who have regarded it simply in relation to its inflammatory character, it has been considered amenable to ordinary antiphlogistic remedies; and bleedings, large bleedings carried *usque ad deliquium*, have been recommended by such persons as essential to its cure. By some, calomel alone, or calomel in combination with opium, together with active and repeated purging, have been used with the view of modifying its symptoms; by others opium has been almost exclusively relied upon, whilst many have insisted, with equal warmth, upon the benefit to be derived from the use of guaiacum and stimulant diaphoretics. Some have employed cinchona, some antimony; some have recommended alkalies, some acids; some have given nitre in large doses; others have relied almost wholly upon colchicum. Each remedy has had its advocates, who have founded their opinion as to its efficacy upon the rapidity with which, in certain cases, the symptoms of the disease have disappeared after its employment. But as

when uncomplicated by cardiac affection, the disease usually terminates, sooner or later, in recovery, and sometimes subsides with marvellous rapidity under every variety of remedy, it is obvious, that no sound inference can be drawn as to the success of any particular method of treatment, unless such treatment has been adopted largely, and has been attended with tolerably uniform results. And I am sure I may say, without fear of contradiction, that each and every plan of treatment which has been hitherto proposed, is regarded by the profession as unsatisfactory. If in one person's hands any particular remedial course has proved efficient, it has signally failed in those of another; if at one time a remedy has proved efficacious, it has been found inert or injurious at another, under different circumstances of age, sex, constitution, and the like. Nor does this appear strange to those who consider the true nature of the disorder, and the variety of circumstances under which the physician may be called upon to minister to his patient's relief. The bleeding, which in the young, plethoric, and robust, may be necessary to allay excessive vascular action and cause free secretion, may, in the weakly, induce irritability of the heart, and a consequent attack of cardiac inflammation. The opium, which in one person may prove of the greatest service in promoting free perspiration and in allaying the general irritability of the system, may, in another, check the biliary and other secretions, and thus prevent the elimination of the rheumatic poison. The continued use of calomel and the constant purging, which may be beneficial to one patient by removing large quantities of unhealthy secretions, may unnecessarily exhaust the strength of another, and tend very greatly to impede recovery. And so in regard to every remedy which has been proposed. What is useful at one time, proves useless or positively

injurious at another ; and the conclusion is forced upon us, that what is wanted, “is far less the discovery of untried methods of treating disease, than of discriminative canons for the proper use of those we possess ;” far less the discovery of any new medicines, than the adaptation of our present remedies to the exigencies of each case.

Unfortunately, until within the last few years, our surmises respecting the origin of rheumatism have been confessedly incorrect ; our acquaintance with many of its commonest and most important phenomena has been imperfect. Hence it has been difficult to make choice of proper remedies, and to apportion them rightly to the relief of the disease. Of late, however, rapid progress has been made towards a full understanding of the nature of the malady. Constant and diligent pathological research, by connecting many internal lesions with its attack, has gone far to elucidate the mystery of its birth ; and close induction, founded upon the observation of its phenomena during life, and upon the evidence of its ravages obtained after death, has served to fill up and illustrate the few uncertain pages of its history. So that, from the knowledge we have now acquired, we are justified in concluding, that its symptoms are dependent on the presence, in the system, of a *materies morbi*, the product of faulty assimilation—of vicious metamorphic action ; that the articular inflammation, though very severe, subsides, in most instances, without leaving behind it any trace of its existence, and is peculiarly prone to affect any part which has been or is in any way subjected to irritation. We have learned that, although there be excessive febrile disturbance, it rarely leads to serious consequences ; although there be active articular inflammation, it does not usually induce disorganisation of the joints ; although the disease be accompanied by every symptom

calculated to cause alarm for the integrity of the structures, and for the continuance of the functions of life, it almost invariably terminates favorably, unless the heart or its membranes become inflamed. Thus have we been taught to recognise and appreciate the grounds on which our treatment should be based; we have been taught the hopelessness of attempting to subdue the fever, or allay the pain and swelling of the joints, so long as the blood is infected by the poison which is at once the source and maintenance of the mischief; as also the importance of neutralising the morbid element, of promoting its elimination, of taking active means to prevent its further formation, and of avoiding everything likely to excite or irritate the heart, and so to render it prone to inflammation.

By what means, then, can we best effect our purpose, and to what extent is it prudent to employ these means?

If the *materies morbi* be indeed an acid, or an acidulous compound; if it be lactic acid, for instance, as there are cogent reasons for believing it to be, then will its neutralization be effected, its irritative property probably diminished, and its elimination promoted by a free exhibition of alkalies and neutral salts; and these objects may be further advanced by the administration of purgatives, sudorifics, and diuretics, to act upon the various excretions. With the view of checking the further formation of the poison, and of restoring that healthy state of assimilation which, at the outset of the disease, is interrupted or arrested, colchicum, mercurials, and alteratives may be given, and, as the febrile symptoms begin to subside, may be combined with, or followed by, the use of quina, or of some other tonic, which, at certain stages of the complaint, may be better calculated to improve the function of assimilation. In allaying the general irritability of the system,

and more particularly the irritability of the heart, opium, belladonna, hyoscyamus, and digitalis, are remedies of the greatest value; and, if vascular action be excessive, and secretion sluggish, bloodletting may be sometimes employed beneficially, and antimony administered in aid of other remedies.

Such is the rationale of the treatment to be adopted. When the objects to be accomplished are fairly understood, the means of attaining them will be obvious to every one conversant with medicine; and the question to be decided is not so much what remedies should be employed, as in what quantities and under what circumstances each remedy should be made use of.

Before explaining my own views on this subject, I will take a brief review of the various remedies and the chief methods of treatment which have been hitherto recommended for the cure of rheumatism; and first, as to the heroic remedy of venesection. In no disease is the febrile heat greater, the pulse fuller or more bounding, the local inflammation apparently more severe, and accompanied by more pain, than in acute rheumatism; in none is the blood drawn more buffed or cupped; in none, therefore, does depletion promise greater success. Accordingly, from the time of Sydenham, free bloodletting has been had recourse to more or less generally; by many as an auxiliary to other treatment, by some as a substitute for all other remedies. Amongst the most recent and strenuous advocates of large and repeated bleedings, have been Mons. Bouillaud in France, and Dr. Macleod in England. These gentlemen recommend the abstraction of three or four pints of blood in the course of the first few days of the attack.¹

¹ From three to six pints of blood were usually abstracted by

They endeavour thus to lessen the force of the heart and arteries, and so to moderate local action ; and they assert, not only that they are generally successful, but that, in many instances, they have arrested or cut short the disease.

Now, without denying the accuracy of their statements, I feel bound to enter an earnest protest against the mode of practice they propose. In certain instances copious and repeated bloodletting undoubtedly appears to mitigate, for a time, the severity of the symptoms, and to render them more amenable to other treatment. But if some cases recover marvellously under its influence, so do they under the use of milder remedies : if in some instances patients go on to recovery without the occurrence of any untoward symptom, a far greater number experience relapses in which the disease returns afresh, with the fearful addition of inflammation of the heart ; if relief sometimes results from its employment, it much more frequently produces little, and but temporary abatement of suffering. Nor are these the only objections to its employment. Though pain and inflammation may be the most urgent and prominent symptoms of the disease, and may seem to demand venesection for their relief, still as these symptoms, if left to themselves, subside almost invariably, without leaving any ill effects behind them, we are bound to hesitate before adopting a plan of treatment which cannot but affect the strength and ultimate well-being of our patient. Even if a predisposition to cardiac inflammation be not engendered, as I believe it to be, by copious and repeated bloodletting,

M. Bouillaud, on the first three or four days of the attack ; and Dr. Macleod was in the habit of taking "from twelve to twenty ounces of blood several successive times, in the course of five or six days, from persons of average robustness." (On 'Rheumatism,' p. 32.)

still convalescence is retarded, the patient weakened and rendered liable to frequent relapses.¹ “Unde,” says Sydenham, “non tantùm ægri vires pro tempore franguntur, sed si paulò fuerit naturâ debilior, aliis etiam morbis ad annos aliquot obnoxior ferè redditur.” Nor is this by any means a rare occurrence; many persons have remained in a weak and sickly condition for months or even years, after having undergone Mons. Bouillaud’s plan of treatment by bleedings repeated “coup sur coup.”

But what of venesection to a smaller amount at the outset of the disease? Would not a moderate bleeding be likely to modify the local action, allay the general irritability of the system, and favour the action of remedies? I confess that, according to my experience, phlebotomy is much too generally adopted. If it could be shown, that in the event of its being omitted, some serious mischief would arise as the effect of the articular inflammation, that the heart would be implicated, or that some serious consequences would result from the severity of the febrile disturbance, then there would be no objection to the use of the lancet. But the experience of all ages has proved beyond dispute, that the febrile paroxysm is usually unaccompanied by danger; that disorganization of the joints very rarely occurs, and supervenes as often when bleeding has been practised as when no blood has been taken from the arm; and recent observation adduces evidence to show, that inflammation of the heart is not more common, if indeed it be not actually less frequent, where other remedies are employed, than when a treatment is adopted in which phlebotomy has its share.

¹ This was so remarkably demonstrated by M. Bouillaud’s cases, that the doctor is forced to admit it to be necessary, “d’éviter avec le dernier soin, le plus léger refroidissement.” (Op. cit. p. 137.)

Mons. Bouillaud, the great advocate of copious and repeated venesection, acknowledges inflammation of the heart to have been the rule, and not the exception in his practice: "*Coincidence à peu près constante, soit d'une endocardite, soit d'une pericardite, soit d'une endo-pericardite avec un violent rhumatisme aigu.*"¹ And Dr. Macleod, who makes no mention of the frequency of endocarditis, reports pericarditis alone in nearly one fourth of his cases. On the other hand Dr. Corrigan, who rarely had recourse to bloodletting, observed only one instance of it among many cases treated by opium; and out of one hundred and sixty-eight cases in my own practice, it has occurred but five times after the commencement of treatment, and in four, if not in all of these instances, within the first twenty-four hours, before the effect of treatment could be felt. Nay, more, though I have treated eighty-three cases of acute rheumatism during the last three years and a half, inflammation of the pericardium has not been set up in any one instance whilst the patients have been under my care, a result which I attribute to the greater rapidity with which I have lately pushed the remedies.

As, therefore, there is no absolute necessity for the use of venesection, as it usually affords only temporary relief, and as by the treatment hereafter to be mentioned, the pulse may be quieted, the pain allayed, and the fever and articular inflammation subdued much more rapidly and certainly than by the most active depletion, I would not recommend the abstraction of blood as a part of ordinary practice. In some instances it is required, and is highly beneficial; but repeated observation has led me to believe, that it is so only

¹ *Op. cit.*, Preface, p. ii.

in first attacks occurring in young, robust, and generally healthy persons, particularly in those which are marked by unusual severity of their symptoms, or are unaccompanied by free perspiration, and by other evidence of activity in the excretions. Even in such cases it should be cautiously employed, and carried to a small extent only, viz., from six to twelve ounces, according to the age and strength of the patient, the object being to favour the action of other remedies, and promote free secretion, rather than to arrest or cut short the disease.¹ In the recurrent disease, venesection, even to a moderate amount, is always unattended by benefit, and is sometimes followed by dangerous consequences; in mild cases it is unnecessary, and therefore to be avoided; in the delicate or those of a weakly constitution, it is clearly inadmissible; and in the strongly predisposed, or when the disease is hereditary, it utterly fails in modifying the morbid action, is often ill borne by the system, and therefore should seldom be practised.²

¹ I am glad to quote, in confirmation of my opinion, the testimony of that able and experienced physician, Dr. Latham. After discussing the expediency of having recourse to it, he adds, "summarily, then, I would venture to say of venesection, employed under the most favorable conditions, and in the most suitable measure, that it is to be trusted, rather as preparatory and auxiliary to other remedies, than for its own exclusive remedial power in acute rheumatism. It very often renders the disease more curable by other means, but it seldom cures the disease itself." ('Clinical Medicine,' vol. i, p. 196.)

² In confirmation of my opinion, as to the general inexpediency of bleeding, I am induced to quote the following practical observations: "As far as I have been able to observe, the benefit of large and repeated bleedings is in most cases far from clear and unquestionable. One of the worst rheumatisms which I remember, immediately succeeded a most profuse bleeding of the nose, which

When venesection is employed in acute rheumatism, the blood drawn is remarkably buffed and cupped, and the

continued so long as almost to exhaust the patient, and to bring his life into imminent danger. Something like this has happened in a second instance." (Dr. Heberden's 'Commentaries,' p. 401.)

"Some practitioners continue to let blood in most cases of rheumatism, thinking themselves justified in their mode of practice by the sizzly appearance of the blood. The same principle might lead them to empty the whole sanguiferous system, for every time blood-letting is repeated, the blood becomes more and more dense and sizzly. I have further observed, that by bleeding repeatedly, the pains, swellings, and febrile symptoms *are not only aggravated at the time, but often protracted indefinitely*; at least, I have seen them continue under such a mode of practice upwards of two months." (Dr. Willan's 'Report on the Diseases of London,' p. 156.)

"While it was the practice to remove the general inflammation by bleeding, metastasis frequently took place to the interior parts of the body, and destroyed the patient. This accident in the author's practice during the last fifteen years, has rarely happened. In this period, he has entirely left off bleeding in acute rheumatism, and has not lost above two or three patients, although he has treated several hundreds in this disease." (Third Dissertation on 'Fever,' p. 18, by Dr. Fordyce, formerly Physician to St. Thomas's Hospital.)

Dr. Alison "has no difficulty in stating his conviction, that large and repeated bleedings, in the beginning of rheumatism, increase the risk of metastasis to the heart," and "that acute rheumatism cannot probably be much shortened in its duration by antiphlogistic remedies." ('Cyclopædia of Medicine,' article "History of Medicine," p. 95.)

"Excessive bleeding, which has been another error in the treatment of acute rheumatism, may likewise protract the disorder." (Dr. Francis Hawkins 'Gulstonian Lectures.')

"It rarely happens, however, from the age of the patient, or the extreme severity of the disease, that venesection is to be had recourse to more than once." (Dr. Seymour's "Lectures," 'Med.-Chir. Review,' vol. xxxiii.)

"On the whole, I would conclude that large and repeated bleed-

patient will bear to lose a large quantity without fainting. But neither of these facts is sufficient to justify the adoption of the remedy, or to warrant its repetition. The tolerance of bloodletting is attributable, without doubt, to the irritant property of the rheumatic poison, and to the stimulating influence which the blood acquires in consequence; and the quantity of fibrin in the blood is so increased,¹ that the cupping and buffing will continue to the last,—will continue

ings should be avoided in rheumatic fever.” (Dr. Todd, on ‘Rheumatism,’ p. 208.)

“Although I am in the almost daily habit of treating this disease, I rarely prescribe phlebotomy.” (Dr. Watson’s ‘Lectures,’ ed. 1, vol. ii, p. 625.)

¹ Messrs. Andral and Gavarret have clearly shown, that the increase in the proportion of fibrin which rises in acute rheumatism, from $2\frac{1}{2}$ or 3 to 8 or 9, or even 10·3 parts in 1000, is due to the existence of local inflammation, and that bleeding exercises very little influence over it, unless it be accompanied by a remission of the local mischief.

It exerts, however, a very manifest and constant influence over the quantity of blood corpuscles, which diminish in proportion to the frequency of the bloodletting, and the amount of blood taken. In illustration of these facts, I subjoin the result of four bleedings in three cases of acute rheumatism.

		Bleeding i.	Bleeding ii.	Bleeding iii.	Bleeding iv.
Fibrin	Case i.	6·5	6·2	7·0	6·9
	„ ii.	5·4	7·0	6·1	5·4*
	„ iii.	6·1	7·2	7·8	10·2
Globules.	Case i.	114·8	111·0	102·8	88·7
	„ ii.	125·3	124·9	121·4	99·6
	„ iii.	123·1	120·7	112·8	101·0

* In Case ii, the pain and inflammation were subsiding at the time of the fourth bleeding. (‘Annals de Chimie,’ vol. lxxv, pp. 240—48.)

when depletion is no longer safe, and when it has been carried to such an extent that an anæmic murmur accompanies the heart's sounds, and a loud *bruit de diable* is audible in the large veins of the neck.

In conclusion, then, without denying the occasional efficacy of venesection in acute rheumatism, I seldom, very seldom, have recourse to its employment. Rarely, indeed, does a case occur in which other and gentler means will not reduce the force and frequency of the circulation, promote free secretion, and allay the fever and local inflammation as rapidly as the most copious bloodletting; and whether owing to peculiar bodily idiosyncrasies, or to other causes equally beyond our ken, the favorable results of venesection are so rarely met with, and the risk of evil consequences incurred by its employment is so great, that, provided as we are with remedies of equal, if not of greater, efficacy, we are not justified, except under the conditions already specified, in having recourse to so dangerous an expedient.

In general estimation, perhaps purging stands next in importance to venesection. The practice of giving large and repeated doses of calomel and purgatives was first, I believe, introduced by Dr. Chambers, and is certainly most powerful in mitigating the severity of the disease. It allays the pain, subdues the fever, and, day by day, gives abundant tokens of its salutary influence. Nor can this be a matter of astonishment to those who are familiar with the features of the complaint. The bowels are often loaded with unhealthy, dark-coloured, offensive secretions: and by the practice alluded to, not only are these poisonous accumulations got rid of, but the stomach and intestines throughout their whole extent are stimulated to inordinate action; the amount of fluid excreted is vastly increased,

and with it a large quantity of the rheumatic virus must necessarily be evacuated.

But if the advocates of this system of treatment have not enlarged too much upon its value, they have at least insisted too strongly upon its invariable employment. 'The bowels, says Dr. Macleod, should be acted on by "calomel in doses of from three to five grains, administered at night, and followed by senna and salts in the morning. This discipline ought generally to be repeated on *several successive days*.'"¹ And Dr. Hope, in the same strain, recommends "calomel and opium at night, and a black dose *every* morning, sufficient to ensure four or five stools at least." Now although, as above stated, I admit the necessity of attending to the state of the alvine secretions, and recognise free and copious evacuations by the bowels as among the most powerful means we possess of allaying the general febrile disturbance, and of promoting the elimination of the rheumatic virus, I must, nevertheless, express my dissent from the practice of repeated active purging. And I do so for three reasons. First, because it is not necessary to the cure of the patient, and, like bleeding, tends greatly to reduce his strength and protract recovery; secondly, because, from the nature of the complaint, the patient is quite incapable of moving, and his sufferings are aggravated, his irritability is increased, and his heart's action accelerated, by the repeated shifting of position, which is rendered necessary by the calls of nature; and, thirdly, because it necessarily gives rise to more or less exposure, which must be prejudicial to a patient bathed in perspiration. On several occasions within my own experience, inflammation

¹ On 'Rheumatism,' p. 34.

of the heart has supervened immediately after the exposure, and the increase of irritability consequent on several successive purgings, and more than once I have been led to believe that this unfortunate occurrence has resulted from the treatment adopted. Accordingly, our constant endeavour should be to obtain a free evacuation every morning, without the risk and great discomfort attendant upon repeated purging. The remedies by which this object is best obtained are,—calomel combined with a full dose of opium at night, and followed, when necessary, on the following morning, by a draught composed of rhubarb or senna with colchicum, and the potassio-tartrate of soda, in just sufficient quantity to produce one full dejection. By these means, not only is an abundant secretion secured from the liver and bowels,¹ but by waiting some hours before administering the purgative, and thus giving the calomel time to do its work, we carry off the excrementitious matter quite as thoroughly as by repeated active purging.

There are certain cases, however, in which larger and more frequent demands may be made upon the intestinal secretions. It happens not unfrequently that persons attacked with acute rheumatism have been constipated for some time prior to their illness. Such persons present all the symptoms of biliary and intestinal derangement in a very marked degree. They complain of a sour and disagreeable taste in the mouth, and of fulness and distension

¹ “The prompt and almost specific effect of mercury on the liver cannot be doubted, but scarcely less in amount or importance is its effect upon the mucous membrane and glandular follicles of the intestines, the secretions from which are often mistaken for those of the liver.” (Holland’s ‘Med. Notes and Reflections;’ cap. on “Mercurial Medicines.”)

at the epigastrium; their conjunctivæ are yellowish, their breath is often foul, the tongue inclined to be dry and very furred and yellow, the motions dark-coloured and offensive, the appetite altogether lost. In these cases there appears to be so much torpidity of the primæ viæ, such an absence of healthy intestinal secretion, and withal, probably, so large an accumulation, in the system, of matter, which ought to have been excreted by the bowels, that it is expedient to exact at least two full alvine evacuations for the first three or four days of the attack. And they are generally accompanied by signal relief. The aperients, though administered in full doses, produce no griping, no tenesmus, no appreciable distress; on the contrary, they are followed by copious, dark-coloured, offensive dejections, the getting rid of which is evidently conducive to the comfort and well-being of the patient. He expresses himself sensible of immediate relief, and the correctness of his sensations is attested by the greater moisture of the tongue, the absence of the previously existing fetor of his breath, and the marked improvement of the general symptoms.

Thus, then, whilst I admit the necessity of close attention to the alvine secretions, and, in some instances, would insist upon repeated calls upon their activity, I feel persuaded that active purging is sometimes, not only unnecessary, but extremely prejudicial to the safety of the patient. In cases unaccompanied by those indications of intestinal derangement before alluded to; in cases in which the bowels are acting freely, and the dejections are healthy and bilious in appearance, purging may be useful as a powerful means of drawing off the poison, but it certainly is unnecessary for the cure of the disease,¹ and must not be

¹ It is doubtless of these cases that Dr. Corrigan speaks, when he

expected to afford the relief observed to follow its action in those cases which especially call for its employment. Indeed, as already stated, observation would lead to its being reserved for exceptional cases. If there be much intestinal derangement, a cure can hardly be effected without it; but if there be not, the discomfort and the risk attendant upon its use are such as to induce us to look for some other means of carrying off the rheumatic poison. And as, in a combination hereafter to be mentioned, an agent exists both powerful and efficient, for the accomplishment of this object, it is seldom necessary to exact an evacuation from the bowels above once in the course of the four-and-twenty hours. Our constant care should be to keep the bowels from being bound, and to avoid purging.

The remedy which, next to venesection and purging, has been employed most frequently in acute rheumatism, is opium. The symptoms of the disease are so strikingly indicative of irritation and excitement, and are accompanied by pain so constant and severe, that the tranquillising influence of opium seems especially called for. Accordingly it has been given at every period of the disease, sometimes in small, sometimes in very large doses. I believe the ordinary practice has been to administer from two to four grains in the course of four-and-twenty hours, premising a blood-letting, and acting from time to time upon the bowels by calomel and salts and senna. This method of treatment is objectionable, both on theoretical and practical grounds;—

gives it as his opinion, that "The patient's bowels, if they have not been constipated at the commencement of the attack, may be not only safely, but with benefit, not disturbed more than once in two days." ('Dublin Med. Journal,' vol. xvi, p. 266.)

theoretically because it is not conducive to the elimination of the rheumatic poison ; and practically, because it fails in materially alleviating the patient's sufferings, and in shortening their duration. In moderate doses, opium has not the slightest influence in calming the nervous system when roused and excited by the agency of acute rheumatic inflammation ; there is then so much of action and of suffering, that I have known four grains taken daily by a child only ten years old, without the production of any sensible effect beyond that of somewhat alleviating his sufferings; and if this medicine is to be made available for relief, it must be given to adults in much larger doses.

Dr. Cazenave, of Pau, was the first to recommend the exhibition of large and repeated doses of opium for the cure of acute rheumatism ; but the physician to whom the profession in this country is indebted for the practice, is Dr. Corrigan, of Dublin. He generally begins with a grain every two or three hours, and recommends that the dose be increased, " both in frequency and quantity, until the patient feels decided relief, when it should be kept up at that dose until the disease is steadily declining."¹ The average quantity required in twenty-four hours, he considers to be about twelve grains ; and even that quantity does not effect the head. Diarrhœa, he says, sometimes occurs while the patient is using the opium in full doses, and purgatives are seldom required. In one case no less than 200 grains were taken in the course of a fortnight, with manifest relief.

Of this method of treatment I cannot speak from personal experience, inasmuch as, by employing other medicines in conjunction with opium, I have seldom been obliged to

¹ 'Dublin Medical Journal,' vol. xvi, p. 266.

make use of it so unsparingly. But I can testify most strongly to the value of the sedative in full and repeated doses; in doses far exceeding in amount the quantity usually administered.¹ In the early and most painful stage of the disease, occurring in adults, it may be often given with the greatest advantage to the extent of six or eight grains in the course of twenty-four hours; and to children may be administered, without the slightest fear, in half-grain doses, repeated every three or four hours. In doses such as these, when combined with the treatment hereafter to be mentioned, I have never seen it check secretion, or produce the slightest cerebral disturbance; rarely, indeed, has it even occasioned sleep, but it has calmed the patient's irritability, alleviated his sufferings, and has thus prevented the wear and tear of the system, arising from a long and painful illness. More than this, too, I believe it has effected. I am satisfied that in many instances it has materially hastened the period of convalescence, and has lessened the frequency of inflammation of the heart. Therefore, whilst I join issue with those who would treat acute rheumatism by opium alone, I admit most fully the advantage of its employment in conjunction with other remedies, and in quantity sufficient to allay or subdue the pain. The amount required for this purpose varies in different cases, and is dependent not only upon peculiar idiosyncrasies, but on the severity of the disease in each particular instance, and the treatment previously and contemporaneously adopted. In cases where opium is employed alone, about twelve

¹ "In procuring sleep (and allaying pain), opium is the most valuable remedy we possess, and *its use is not to be measured timidly by tables of doses, but by the fulfilment of the purpose for which it is given.*" (Holland's 'Med. Notes;' cap. "On the use of Opiates.")

grains probably may be required to subdue the pain and pacify the excitement of the nervous system ; but with the aid of other remedies, six or eight grains are usually sufficient ; and in some few instances our object may be attained by the exhibition of four or five grains only in the course of four-and-twenty hours. Sure am I, that, as a general rule, the continuance of pain is the best practical test of the propriety of its administration and of the extent to which its exhibition is required, and that whether ten or two grains only are needed in the course of the day, it may be given with impunity, and indeed with advantage, as long as pain and restlessness continue.¹ I know of nothing to contra-indicate its use, save only the suspension of secretion ; and I am aware of no circumstance calculated to point to its having been given in too large doses, except the supervention of stupor or narcotism. On neither of these points is there the least cause for alarm. The latter symptom will never arise if the medicine be given cautiously, and its operation carefully watched ; and observation has convinced me that it suspends secretion in exceptional cases only. Indeed it appears probable that opium, when given in quantity sufficient to subdue the pain and allay the irritation, so far from impeding or suspending secretion, conduces in some instances to its promotion. Certain it is, that in the excited state of the nervous and vascular sys-

¹ “ When given for the relief of acute pain or spasmodic actions, in some parts of the system, it would seem that the medicine, however vague the expression, expending all its specific power in quieting this disorder of the nervous system, loses at the same time every other influence on the body. Even the sleep peculiar to opium appears in such instances to be wanting, or produced chiefly in effect of the relief from suffering.” (Holland’s ‘Medical Notes,’ cap. “On the use of Opiates.”)

tems, arising from the irritation of the rheumatic virus, all the excretory organs, except the skin, perform their function slowly and imperfectly; the scanty urine, the dark coloured unhealthy motions, and the coated tongue, testify abundantly to this important fact; and equally certain is it, that during the administration of opium the urine frequently increases in quantity, the motions become more healthy in appearance, and the coated tongue cleaner and less red. So that, on the whole, the treatment by opium is a safer and a better plan than the treatment by purgatives, if the bowels have been acting regularly and still continue to do so; but the treatment by purgatives is the most efficient and most certain, if the bowels have been previously bound and still show a disposition to be confined.

Venesection, then, calomel combined with purgatives, and opium, are the three remedies which have been most generally made use of for the cure of acute rheumatism, and each in its way has been found conducive to the well-being of the patient. But there are several other remedies which have been so highly spoken of, and so extensively used, that it will be necessary to advert to their influence on this disease before detailing my method of treatment. I allude to vapour and hot-air baths, and to mercury, antimony, cinchona, colchicum, guaiacum, nitre, lemon juice, alkalies, and their salts.

Forced perspiration has been always much in vogue as a remedy for acute rheumatism. Formerly, though actually streaming with perspiration,—the acid perspiration so characteristic of the disease,—the patient was made to swallow large doses of antimony, Dover's powder, and other sudorifics; was placed in a bed covered with blankets, subjected to the heat of hot bottles and hot bricks, and deluged with copious draughts of warm drinks.

In modern times, though not so carefully, "*accinctus ad sudorem*," the unhappy sufferer has been sweated quite as freely; vapour and hot air baths have been substituted for the extra bed-clothes and hot bottles, and guaiacum, Dover's powder, and other sudorifics have been given freely and repeatedly. So copious is the diaphoresis thus produced, that the perspiration has often soaked through the blankets and the mattress, and has formed a pool on the floor. But the experience of all ages is against the adoption of this method of treatment. Sweated almost beyond belief, and exhausted in a corresponding degree, the patient obtains very little relief to his sufferings, and is so much reduced in strength, that he is frequently afflicted by an eruption of sudamina, recovers slowly and imperfectly, often experiences a relapse, and is generally subject for a considerable time to wandering pains in the limbs. Repeated observation has fully convinced me of the inexpediency of this method of treatment, except in cases unaccompanied by free perspiration. In such cases, and in such alone, it may be employed with advantage, but even then it should be omitted directly a free and natural diaphoresis has been established.

Another plan of treatment, which has been recommended for the cure of acute rheumatism, is the administration of mercury in combination with opium, so as to produce salivation. In my opinion, however, this practice is not only unnecessary, but decidedly prejudicial to the well-being and safety of the patient. When given so as to affect the mouth, mercury proves exceedingly depressing, and is sometimes productive of evil consequences which may be felt for months, or even years. Moreover, it exerts no perceptible influence over the rheumatic poison, nor does it assist in preventing the access of cardiac inflammation; on

the contrary, I have repeatedly observed with Dr. Macleod,¹ "that the rheumatism has continued, although the mouth was affected, while it has speedily subsided on continuing the narcotic and purgatives without the mercurial." Moreover, pericarditis and endocarditis supervene as readily whilst the patient is under the influence of mercury as when that drug has not been administered; and when such is the case, we lose the most valuable property of mercury, namely, that of limiting the effusion of lymph on the inflamed surfaces of the heart. Such being the case, mercurial action should never be induced as a cure for an uncomplicated attack of acute rheumatism.

M. Laennec was a strong advocate for the administration of tartar emetic in full and repeated doses. He says, "there is no inflammation, except inflammation of the lungs, in which tartar emetic is more efficacious than in articular rheumatism. The medium duration of the disease, under the influence of this remedy, is from seven to eight days; and we know that it continues from one to two months under the treatment of bleeding, or of 'la méthode expectante.'"²

Now, admitting most fully the efficacy of this medicine as an auxiliary to other remedies, I cannot recommend its administration by itself as a remedy for acute rheumatism. Valuable as are its powers in moderating local action, it is insufficient of itself to fulfil the conditions essential to a safe and speedy cure of the disease. And not only so. More extended observations have not tended to verify the extraordinary curative powers ascribed to it by M. Laennec; still less have they discovered in what manner any curative

¹ On 'Rheumatism,' p. 360.

² 'Traité des Maladies des Poumons et du Cœur,' ed. 2, p. 512.

influence is exerted. That its virtue is independent of its action as a diaphoretic or diuretic, is fully admitted by M. Laennec, who, whilst eulogising its power of subduing the articular inflammation and effusion, suggests that it acts by "promoting the activity of the interstitial absorption, more especially when there exists in the economy an excess of energy, of tone, or of plethora." Whatever its mode of action, however, its efficacy is displayed most strikingly in the cases here alluded to by M. Laennec; and, therefore, in the young, the active, and plethoric, in whom it serves to obviate the necessity for bleeding or other antiphlogistic measures, it may be employed in conjunction with remedies having more decidedly curative properties. But to the more weakly, and to those whose symptoms are less acute, it often proves extremely depressing, and as it is unnecessary for the relief of the local inflammation, recourse should seldom be had to its administration.

The administration of bark in acute rheumatism, is contrary alike to analogy and to experience. It is inconsistent with the active nature of rheumatic inflammation: it is contra-indicated by the intensity of the febrile disturbance, by the full and bounding pulse, the furred tongue, and the loaded urine; and it is forbidden by the marked aggravation of the symptoms which usually follows its incautious exhibition. It has nevertheless been so well spoken of by men whose recommendation is deserving of attention,¹ that it may be right to examine somewhat in detail the history of the cases on which such favorable opinions have been founded.

¹ The cinchona was extensively used by Dr. Haygarth, at the latter end of the last century, and has been sanctioned by the testimony of Dr. Fothergill, Dr. Heberden, Sir George Baker, Sir Walter Farquhar, and other physicians of experience and reputation.

Dr. Haygarth, one of the most strenuous advocates of this method of treatment, was in the habit of giving doses of from ten to thirty grains of the powder, or from an ounce and a half to two ounces of the decoction of bark, three or four times a day. He generally began to give it between the third and the tenth day of the attack, at a time when the articular inflammation was most acute, and was accompanied by active febrile disturbance. Yet, he says, "I can only discover five instances in which the bark did not produce manifest salutary effects on its first exhibition."¹ No opinion can be more decided, or more favorable to the influence of the remedy, and none certainly can be in more direct opposition to the result of modern experience. Fortunately, therefore, he has given to the world a record of the cases on which his favorable opinion is based, and from these very cases it is difficult to arrive at any other than an opposite conclusion. Out of the 170 cases of acute rheumatism which he has recorded, 49 were treated by salines, antimonials, purgatives, and bleeding, whilst the remaining 121 were treated more or less completely by bark. Out of the whole number, 19² had symptoms of "phrenitis" and "delirium," and of these 19 cases, no less than 17 were met with among those to whom the cinchona was administered,—a fact which affords a fearful commentary upon this inconsistent and empirical method of treatment.

In my own practice, bark has never been given at such an early period of the disease, nor have I often seen it so administered by others; but I have repeatedly watched its administration at a later period, while the tongue has still

¹ 'Clinical History of Disease,' p. 108.

² In column ix of Dr. Haygarth's tables, sixteen cases only are mentioned, but three others are to be found in column xvi.

continued furred, and the pulse excited; and it has been so constantly followed by a fresh accession of mischief, that I have been deterred from making use of it until the urine has cleared, the pulse has become soft, and the tongue moist and almost clean. Then, more especially in cachectic states of constitution, or in persons who have been much exhausted by the attack, it is often of essential service; but even under these circumstances its effects must be carefully watched, in order that its administration may be abandoned at once, should any increased heat of skin, acceleration of the pulse, or coating of the tongue or loading of the urine, appear to indicate a recurrence of fever. Indeed, it is only in the very weakly and cachectic, that it is ever advisable to have recourse to its employment, for in the great majority of instances quina is more readily and earlier tolerated; and as it is quite as efficient as bark, it should have the preference when an eruption of sudamina, the character of the pulse, or the cleaning of the tongue appears to demand or admit of the exhibition of a tonic. It should be used as a corrective and restorative of the processes of assimilation when the febrile paroxysm is beginning to abate, rather than as a cure during the active stages of the disease.

Colchicum is a medicine which has been lauded as much too extravagantly by one class of practitioners, as it has been abused too indiscriminately by another. By some it has been called a specific for acute rheumatism, and by such has been exclusively relied on for its cure; and in proof of its efficacy, cases have been adduced in which not only has the disease disappeared under its influence, but its subsidence has been accompanied by profuse evacuations from the kidneys, the stomach, or the liver, and bowels. The pain has abated, and the pulse has become

more tranquil, coincidently with the occurrence of purging, or vomiting, or diuresis.¹

In stating these facts, I am saying all that can be said in favour of colchicum administered alone for the cure of acute rheumatism. All practitioners will admit, that when it causes purging or vomiting, or excites an abundant flow of urine, it may possibly of itself effect a cure; but few, I think, are disposed to ascribe to it a curative power except under these conditions. Purging and vomiting, however, are among the first symptoms of poisoning by colchicum, and are often accompanied by such extreme prostration, and by so much gastro-intestinal irritation, that when it becomes a question whether the cure of the disease can be safely intrusted to colchicum alone, the prudent physician very properly hesitates in recommending or adopting so dangerous an expedient. He refuses to rely solely upon a medicine which is apt to produce such disagreeable effects, and tries to discover some method by which he may obtain from it its virtue as a remedy, without running the risk of its action as a poison.

Now this may be effected by administering it in small doses in combination with other medicines; and although in this form it may not have the power of *curing* acute rheumatism, it has at least the property of alleviating its symptoms, and shortening their duration. It does so, I believe, not by operating simply as a sedative, nor by acting specifically upon the rheumatic virus, but by promoting its evacuation by the kidneys, and by exercising some influence over the process of assimilation, whereby the formation of the poison is checked. Be this as it may, immediate benefit

¹ See 'London Med. Gazette,' June 30, 1838.

so repeatedly results from its administration in conjunction with small doses of calomel, ipecacuanha, alkalies, and opium, and in chronic cases, is so frequently obtained by its administration uncombined with other remedies, and in doses insufficient to produce any sensible effect upon particular organs, that no one can hesitate to assign to it the improvement in the instances alluded to.

But it is not equally beneficial in all cases of acute rheumatism, nor in all forms nor at all stages of the complaint. It is far less efficacious in the weak and nervous, than in the more robust and less easily depressed, and of less value in purely fibrous rheumatism, than in cases complicated by synovial inflammation. In my hands, too, it has proved less advantageous in proportion as the fever has exceeded the articular swelling, and as the urine has been less highly charged with the lithates.

But though colchicum is of the greatest value in the treatment of acute rheumatism, its operation must be watched most carefully. Throughout its administration it is impossible to insist too strongly upon the necessity of securing a daily evacuation from the bowels, and of attending to the other general symptoms of the disease. If the lithates disappear from the urine, if the pulse becomes weak, if faintness, or nausea, or purging supervenes, its use must be instantly discontinued. But until some one of these symptoms occurs, a grain or a grain and a half of the acetous extract or the inspissated juice, or from fifteen to twenty minims of the wine of colchicum may be administered safely and with obvious advantage two or three times a day.

Of guaiacum I have had considerable experience. I have seen it administered by my colleagues at St. George's Hospital, sometimes alone, sometimes in conjunction with other remedies, in a large number of cases, and I have

myself prescribed it on several occasions with some apparent advantage. Observation, however, has not led me to form a very favorable estimate of its curative power in this particular form of the disease. In persons of a weakly broken-down constitution, and in subacute cases unaccompanied by the characteristic acid perspiration, it has sometimes proved of essential service in stimulating the action of the skin; but in most acute cases, if it has done no harm, it has effected little good as compared with other remedies: it has neither appeared to mitigate the symptoms, nor to shorten their duration.

There is, however, as much difference in regard to the action of this medicine in different cases, and in different doses, as there is in regard to colchicum. Dr. Seymour, who was in the habit of giving the *mistura guaiaci* of the 'Pharmacopœia' in full and repeated doses, says: "It acts not as a stimulant, but as an evacuant, provoking purging, perspiration, and a flow of urine in a very violent manner: sometimes one, sometimes all these effects follow the use of the medicine."¹ Now, in my experience, the beneficial effects of guaiacum in the acute disease are observed precisely under the conditions pointed out by Dr. Seymour; they are obtained in those cases, and in those alone, which are unaccompanied by perspiration, and in which the excretory organs are greatly excited by the action of the remedy. But in ordinary doses, and under ordinary circumstances, when the patient is perspiring freely, and when it neither purges nor causes diuresis, very little benefit results from its employment. It neither modifies the local

¹ Clinical Lectures, published in the 'Medical Gazette,' and the 'Medico-Chir. Review,' vol. xxxiii.

action nor limits its duration ; and as the purging induced by its operation is sometimes most distressing, its exhibition should be reserved for subacute or lingering cases, in which, when it provokes a free perspiration, its beneficial influence cannot be doubted.

The nitrate of potash has been largely employed for the cure of acute rheumatism, both in this country and on the Continent, in doses varying from a few grains to two or even four drachms three or four times a day. In the smaller quantities I have frequently given it in combination with other remedies ; and on several occasions I have seen it administered to the extent of an ounce in the course of four-and-twenty hours. Generally, it has been without obvious action on the excretory organs, and has exerted little influence over the intensity of the symptoms, or the duration or ultimate issue of the disease.

Mons. Gendrin in France, and Dr. Basham in this country, have been lately adopting the practice recommended by Dr. Brocklesby, in 1764,¹ of giving large and repeated doses of this salt. Dr. Henry Bennett speaks most favorably of its efficacy as administered by Mons. Gendrin at the Hospital of La Pitié. He states that the salt, when properly administered, "is from the first tolerated in the great majority of cases," but that sometimes "the injection

¹ 'Medical Observations,' by Dr. Richard Brocklesby, 8vo. ; London, 1764. The Doctor states, "that for diet and sustenance, the patient should be confined to the free use of water-gruel, in each quart of which two drachms of nitre were to be dissolved, and when the stomach would allow the quantity of drink, two drachms or more of nitre would be taken in the four-and-twenty hours. It usually caused free perspiration, and acted sufficiently as an aperient, and when it failed in this respect, the help of injections was added."

of the solution occasions slight vomiting." During the first twenty-four or thirty-six hours, very little change is produced in the state of the patient; but, generally speaking, about that time, sometimes a little later, the pulse diminishes in strength and number, and that without any perceptible change in the state of the patient." He has "seen many cases in which the renal secretion has been decidedly increased, and sometimes the excretions of the skin are also much increased;" and "when this occurs, he has remarked that the pulse falls much more rapidly than when the depressing effect of the salt is alone experienced."¹ Dr. Basham also speaks highly of its value when freely administered. "One, two, or even three ounces of it freely diluted, may (he says) be taken in the twenty-four hours in cases of acute rheumatism, and in the majority of cases without producing any obvious effect on the force or frequency of the pulse, the integrity of the digestive function, the state of the abdominal organs, or even upon the quantity of urine excreted," but "it relieves in a marked manner the swelling, heat, and pain of the joints." He has "never seen the nitrate of potash in large or small doses produce either nausea or vomiting."² In a few cases pinching or griping pains of the abdomen, with a few watery evacuations, which have quickly ceased on discontinuing the

¹ On the Treatment of Acute Rheumatism by large doses of Nitrate of Potash. ('Lancet,' for 1844, vol. i, p. 374.)

² Such symptoms nevertheless do sometimes occur. Dr. Robert Barnes reports, that "in one case which he watched in the wards of M. Gendrin, alarming diarrhoea supervened on the second day, together with vomiting and pain on pressure over the region of the stomach, and increase of febrile movement." ('Lancet,' for 1844, p. 472.)

salt, are the only unpleasant or undesirable effects which he has witnessed.”¹

Now I heartily wish I could confirm this favorable report of the curative action of nitrate of potash, but such unfortunately is not the case. I have watched its administration to the extent of about an ounce daily, in seventeen cases of acute rheumatism, and to a smaller extent in several others, and in one instance only did it appear to exercise any decided control over the course or duration of the symptoms. In most instances it was readily tolerated by the stomach; and in the case alluded to gave rise to copious diuresis, with manifest relief to the pain and inflammation; but in every other instance it was without any obvious effect upon the excretions, and the disease continued of average intensity, and ran on to its ordinary duration. Indeed, in the cases reported by Dr. Basham, the patients on the average were four weeks and a half under treatment, and as application is seldom made to a hospital until the patients have been ill some days at home, the average duration of the cases alluded to can hardly have been less than five or six weeks, which is a period of quite the average duration. But as nitre, contrary to the observation of Dr. Basham, *does* appear to exercise a powerful influence over the vascular system,² diminishes the force and frequency of the heart's action, and controls the tendency to fibrinous deposition by increasing the solubility of the fibrin, it is valuable in acute rheumatism, not so much by effecting a cure of the

¹ On the Nitrate of Potash in Acute Rheumatism. ('Med.-Chir. Trans.' vol. xxxii, pp. 5, 6.)

² Mr. Alexander found by experiment, that nitre most surprisingly and most rapidly diminishes the frequency of the heart's pulsations. (*Vide* 'Essays,' p. 105, et seq.)

disease, as by tending to prevent those untoward complications which render it so formidable.

Lemon juice in one or two ounce doses, repeated three or four times a day, was introduced as a cure for acute rheumatism by Dr. Owen Rees. He supposed that, by the excess of oxygen it contains, it promotes the conversion of lithic acid into urea and carbonic acid, and thereby favours its excretion from the system, while the small quantity of alkaline citrate which it contains, contributes also in some measure towards effecting a cure. A more plausible explanation appears to me to be that its curative effect depends upon its supplying a necessary material to the blood and promoting the oxidation of lactic acid, and its conversion into carbonic acid. Whatever its mode of action, however, the remedy had the advantage both of simplicity and novelty, and accordingly for some time was very generally adopted. But after an ample trial it has now been discarded as uncertain in its action; and physicians are again content to rely upon a more rational, though more complex, method of treatment.

The advantages claimed for this remedy by Dr. Owen Rees, are power to moderate vascular action and to afford speedy relief to the rheumatic symptoms. Judging, however, from my limited experience, I cannot conscientiously speak of these effects as the ordinary results of its administration. I have watched its exhibition in twenty-nine patients, and although in several it produced much depression, in some gave rise to griping pains in the abdomen, and in one excited violent diarrhoea, accompanied by a copious discharge of blood from the bowels, yet in three patients only did it appear to afford relief, or to hasten recovery.

In the three instances alluded to, it was taken in full

doses, viz., eight ounces in the twenty-four hours, and was not only tolerated, but as far as I could judge, was speedily assimilated in the stomach; and its influence in quieting the heart's action, in promoting a free evacuation from the kidneys, and in causing subsidence of the articular inflammation, was very marked. But in most cases it did *not* appear to be readily digested, as was evidenced by the length of time which elapsed before the patient became free from its flavour; and it is probable that its frequent failure in alleviating the symptoms of the disease may be attributed in part to this cause, and in part to the fact that the blood in many cases requires materials which lemon-juice does not contain or is not capable of supplying. Be this as it may, the results of its administration were anything but encouraging. And on analysing the cases reported by Dr. Rees, I do not find that he has obtained a much more favorable result; for, on the average, his cases were twenty-five days under treatment, and were ill for a period of forty days, a term within which the symptoms will have subsided, and health will have been restored under most methods of treatment. Therefore, without denying that lemon-juice may, in some instances, prove beneficial, I would not generally recommend its employment. If alkalies and the neutral salts cannot be given in full doses, in consequence of their being rejected by the stomach, and if other treatment fails in its object, then perhaps lemon-juice may be tried; but it is less efficacious in curing the patient, and relieves his sufferings far less certainly and speedily than does the treatment I ordinarily pursue.

But though I do not counsel the administration of lemon-juice as a medicine on which to rely for the cure of acute rheumatism, I am of opinion that numerous instances occur

in which its influence may be beneficially exerted in aid of other remedies. Many persons adopt a diet which is apt to lead to a deficiency of vegetable acid in the system, and whenever there is reason to suspect such a deficiency, I order lemonade to be taken as a beverage, whilst the disease is being combated by other means. Nor have I ever had occasion to regret its administration, under the conditions referred to, for it has generally proved grateful to the patient, and apparently serviceable in checking the disease. And although if given indiscriminately it often fails in affording relief, it seldom does harm or occasions discomfort unless it disagrees with the stomach, in which case its use must be discontinued.

Of the value of alkalies and their salts in acute rheumatism, it is impossible to speak too highly. Whether regard be had solely to the facts that the normal alkalinity of the saliva disappears, that the acidity of the perspiration is excessive, that the urine is surcharged with acid, and that the alvine dejections are also loaded with acidulous matters; I say, whether regard be had solely to these significant facts, or whether the question be viewed in reference to the occurrence of fibrinous deposits on the valvular apparatus of the heart, alkalies in either case cannot fail to prove useful. They are not only active depurating agents, and corrective of the abnormal condition of the blood and the excretions, but, in great measure, they are preventive of the deposition of fibrin.¹ Administered alone, however, and in ordinary doses, they are inadequate to effect a speedy cure. The system is so surcharged with acid, that no ordinary doses can restore its alkalinity; and even when given in

¹ See Simon's 'Chemistry,' in 'Sydenham Society's Publications,' pp. 116—17.

doses sufficient to effect this purpose, alkalies in many cases prove unequal to restore a healthy state of assimilation, and to prevent the further formation of acid in the system. Of this I am fully satisfied by experience. The pain may be greatly alleviated, and the force of the febrile and inflammatory symptoms checked, but no certainty can be felt as to arresting the disease, without the aid of other medicines to assist in modifying the function of assimilation, and to act on the various excretory organs.

It will be gathered from what has been already stated, that my chief objection to many of the expedients which have been resorted to for the cure of acute rheumatism, lies not so much against the remedies themselves, as against the mode in which they have been employed. Each remedy or class of remedies has been too exclusively relied upon. There may be occasions in which bloodletting or opium, or calomel and active purging, are necessary; there may be circumstances which call for the exhibition of guaiacum, nitre, colchicum, or other agents; but it seldom if ever happens that the cure of acute rheumatism can be safely intrusted to any single remedy. For as the disease presents different aspects in different cases, so does it also at different stages in the same individual; and even were it not so, the constitutional disturbance is so great, the cause of the derangement is so widely spread, and its effects extend to such a variety of organs, that every principle of medicine points to a compound method of treatment as most likely to lead to a successful issue.

The treatment to which I usually have recourse at the outset of the attack, is that alluded to at the beginning of this Chapter. It is made up of alkalies and the neutral salts, with colchicum, opium, and if necessary, calomel. Some-

times a little antimony is added, sometimes the aid of purgatives is had recourse to, and occasionally, though rarely, I deem it expedient to premise a moderate blood-letting. Baths are never employed if the skin is acting freely; but if, instead of being bathed in perspiration, it remains dry and hot, and burning, I then endeavour to stimulate its action by means of the vapour or the hot air bath.

As venesection, if employed at all in acute rheumatism, is to be made use of with the view of producing an impression on the train of morbid actions, and expediting the operation of other remedies, it must necessarily take the lead of all other measures; and the first question to be decided, therefore, in every case of acute rheumatism, is as to the propriety of having recourse to its employment. It has been already pointed out, that the use of the lancet is not necessary for the relief of the pain or the tranquillisation of the pulse, and that in the pale and weakly it exercises an influence prejudicial to the patient by rendering more irritable his already irritable and excited heart. But in the young, plethoric, and robust, in whom secretion is insufficient, whose pulse is full and bounding, and whose skin is dry and hot, and burning, it certainly does assist in expediting the action of other remedies, and so in promoting recovery. These, therefore, are the only cases in which it should be employed, and a single bleeding of from eight to ten ounces is generally sufficient. It relieves that excessive congestion on which the want of secretion, in great measure, depends, and which forms an obstacle to the action of those remedies on which we rely for effecting a cure.

The next point is as to the expediency of giving calomel and purgatives. If the bowels are acting once a day, it is seldom necessary to make a more frequent call upon their

activity, but a dose of calomel and opium may be prescribed with the view of modifying the character of their secretions. If the bowels are sluggish in their action, and the dejections, dark coloured and offensive, a dose of calomel combined with opium should be administered at once, and followed, after the lapse of six or eight hours, by a draught containing the infusion of senna, together with half an ounce of the potassio tartrate of soda, and twenty minims of the vinum colchici. And the amount of opium should be so adjusted to the dose of the purgative, as to procure one full and copious evacuation without the distress attendant upon purging.

When once the bowels have been freely acted on, the state of the secretions must be our guide as to the repetition of the calomel and the morning laxative. If the tongue be rather dry; if the bowels continue sluggish, and the dejections dark coloured and offensive, the mercurial and the purgative should be repeated for several successive days. If, on the other hand, secretion from the bowels be healthy, the further exhibition of mercury is unnecessary. If, again, the secretions be copious but unhealthy in character, the calomel and opium should be repeated at night, but need not be followed by a purgative in the morning, as after one or two doses of the mercurial, the motions become lighter coloured, more bilious in appearance, and of a less offensive character.

Whilst the state of the intestinal secretions are thus attended to, alkalies and the neutral salts should be administered in full doses in combination with a few drops of colchicum wine. In some instances the addition of opium is necessary, in others a little antimony is useful. At one time I used to content myself by giving a saline draught, with the addition of fifteen or twenty grains of the carbon-

ate of potash, or the carbonate of soda, three or four times in the course of the day, but it soon became apparent that in order to obtain the full benefit of alkalies, it is necessary to give them in very much larger quantities—in doses proportioned to the extreme acidity of the system.¹ In ordinary doses they generally mitigated the severity of the pain, yet failed in affording more than partial relief, whilst in the more important matter of protecting the heart from mischief they often proved inefficacious. Indeed, it was obvious that until the urine and saliva become alkaline, and thus give evidence of the full effect of the alkalies on the system, the heart remains exposed to the danger of inflammation. My endeavour, therefore, has ever been to produce this altered condition of the secretions as speedily as possible, and with this view I have administered alkalies in large doses repeated, at short intervals. Nor have I seen reason, on any one occasion, to hesitate in following out this plan of treatment. It has now been pursued in a large number of cases, and in almost every instance has produced the most astonishingly favorable results. The patients have speedily lost their pains and have proceeded rapidly to convalescence. In one hundred and six out of one hundred and sixty-eight cases in my note book, the pulse was tranquillised within forty-eight hours from the commencement of treatment, and in one hundred and ten the pain was lulled, and the local

¹ Though I speak throughout of the administration of *alkalies*, I include under this term the neutral salts, such as the potassio tartrate of soda and the acetate of potash, which, as pointed out by M. Wöhler, very readily undergo oxidation in the system, and being converted into carbonates or bicarbonates, react on the secretions as alkalies. In large doses they are much more readily tolerated by the stomach than corresponding quantities of the alkaline carbonates.

inflammation greatly subdued within the same time, whilst in most of the remaining cases a longer period was required, in consequence either of previous constipation, or of the co-existence of some internal complication. Moreover, amongst the last hundred and twenty-six cases in which the heart remained free from inflammation at the time the patients were first brought under my care, not a single instance of pericarditis or endocarditis has occurred, the heart having been protected by the administration of the remedies in the manner already pointed out.

The form in which I usually prescribe the remedies, is that of an effervescing citrate of potash or ammonia draught with an excess of from forty to sixty grains of the bicarbonate of potash, or bicarbonate of soda, to which, if the patient be a person of average strength and robustness, bathed in profuse perspiration, with red, swollen, and exquisitely painful joints, a furred tongue, loaded acid urine, and a full and bounding pulse, I usually add a drachm or more of the acetate of potash,¹ and ten or fifteen minims of the vinum

¹ The virtue of alkalies and their salts in rheumatism depends, I believe, upon their power—

1st. Of acting as restorers of the alkaline condition of the system.

2dly. Of assisting to maintain the solubility of the fibrin, and thereby preventing its deposition on the valvular apparatus of the heart.

3dly. Of acting most powerfully as sedatives, and calming the action of the heart and arteries.

4thly. Of increasing the metamorphosis of tissue, and proving active provocatives of an increased secretion of urine, whereby the elimination of the *materies morbi* is assisted.

Whatever their mode of action, however, their effect in restoring the alkalinity of the system, and of allaying the fever and subduing the pain and inflammation, which accompany, if they be not consequent upon, the opposite condition, is very remarkable, as is also

colchici, or, if the bowels are costive, I give one or two drachms of the potassio tartarate of soda instead of the acetate of potash, taking care to regulate the purgative action of the salt by the administration of a few minims of the tinctura opii, or of Battley's sedative solution. This draught is repeated, for the first twelve or twenty-four hours, at intervals of two, three, or four hours, according to the strength of the patient and the severity of the attack.

Sometimes, more especially if the lungs are implicated, from fifteen to twenty minims of the vinum antimonii are added, and if the pain is excessive, I prescribe a pill containing from half a grain to a grain, or a grain and a half of opium, or an equivalent dose of Dover's powder to be taken once or twice a day, taking care to increase or diminish the quantity of the sedative, according to the circumstances of the case; on the one hand avoiding constipation and narcotism, and on the other, guarding against diarrhœa.

Formerly, I used to administer the remedies in a simple saline or nitre draught, and prescribed an effervescing draught only when the stomach did not easily tolerate large doses of alkalies, or of the neutral salts. But the addition of lemon juice and an alkaline carbonate forming a saline effervescing drink, deprives the medicine of so much of its nauseous quality, and renders it so much less liable to derange the stomach, that I now make a practice of ordering each draught to be taken in a state of effervescence. And with this precaution, an instance rarely occurs in which any nausea or discomfort is produced.

their influence in calming the action of the heart and arteries, and in causing an increased flow of urine and a vast augmentation in its solid constituents. These facts receive very striking illustration in the cases reported at the end of this Chapter.

When once the medicine has begun to take effect, which is evidenced by the gradual decrease of the pain, the tranquillisation of the pulse, the alkalinity of the urine, and the increase in its quantity and density, the remedies are repeated every fourth hour only, and then every fifth or sixth hour; and usually at the expiration of two or three days, I find their work in great measure accomplished. Sometimes, indeed, before the expiration of twenty-four hours, the saliva has lost its acidity, the inflammation has subsided, the pain is much subdued; the pulse has fallen, probably, from 120 to 85 or 90 beats in a minute; the tongue has become moister and less red and furred; the urine more abundant, of a higher specific gravity, often clear, and sometimes even alkaline, and the perspiration less acid, less sour smelling, and less profuse. In proportion as these symptoms of amendment manifest themselves, so is the dose of the alkalies decreased, until, after the lapse of three or four days, I usually feel justified in commencing the administration of quina or bark, in combination with small doses of bicarbonate of potash, taking care to maintain a free action of the bowels, by exhibiting, now and then at bedtime, two or three grains of the acetous extract of colchicum, together with aloes or rhubarb, and, if necessary, a grain of calomel or blue pill. Should there be any acceleration of the pulse, the slightest return of pain, the least increase of coating on the tongue, the least loading of the urine, or, indeed, any evidence of returning fever, the use of the tonic is at once abandoned and alkalies are again resorted to. But generally the case proceeds steadily to convalescence, and after a few days the pills are either omitted altogether, or repeated less frequently and in diminished quantities. Sometimes, if there be not much tendency to perspiration, the *mistura*

guaiaci of the Pharmacopœia may be administered with the addition of a drachm of the volatile tincture of guaiacum, and thirty or forty minims of liquor potassæ, or as many grains of bicarbonate of potash, whilst if the patient appears to be cachectic, the decoction of cinchona, with the addition of the ammoniated tincture of guaiacum, or of half a drachm of the extract of sarsaparilla with three or four grains of iodide of potassium, and twenty or thirty grains of bicarbonate of potash proves a more active and efficient agent.

But I do not confine myself to internal remedies. I endeavour to alleviate articular inflammation by means of external topical applications.

By many persons this practice is regarded as useless, and by some has been condemned, on the ground that, by interfering with the inflammatory action taking place at an affected rheumatic joint, we incur the risk of disturbing the attraction of the morbid element, and of driving it to some internal viscus. Doubtless, if cold topical applications were to be employed, and the elimination of the poison thus forcibly arrested, a very hazardous experiment would be tried, and serious internal mischief would probably arise. But against leeches, blisters, and warm fomentations, this objection cannot be reasonably urged: they do *not* check the continuance of perspiration; they favour rather than arrest the exit of the morbid matter, and the only fact, therefore, to be ascertained in regard to them, is their remedial or curative power.

It has been already stated, that rheumatic inflammation very rarely leads to disorganization of the joints, and moreover displays a remarkable disposition to shift or migrate from one spot to another. Hence leeches and blisters are rarely called for in the acute disease; they are generally

unnecessary for the relief of the inflammation, and are useless in most cases because of its repeated migration. They might, and indeed they do, afford very marked relief to the severity of the inflammation, but they afford no guarantee against its recurrence. Their use, therefore, should be restricted to cases in which inflammation lingers about a particular joint, or in which the intensity of the action is so great as to threaten the integrity of the structures. But warm fomentations of every description may be always employed advantageously. They soothe the parts, promote perspiration, and thereby favour the elimination of the poison. As the object of the applications is to allay the pain, and counteract the extreme acidity which always accompanies, if it be not the cause of, rheumatic inflammation, it is manifest, theoretically at least, that an alkaline and opiate solution should prove the most effective remedy. And so in practice it is found to be. I have tried hot water; I have tried a warm solution of nitrate of potash, as recommended by Dr. Basham; I have tried a simple alkaline solution; and I have tried a mixed alkaline and opiate solution, and the latter has proved the most powerful in allaying the pain of rheumatic inflammation.¹ In every instance in which it has been employed, the relief obtained has been almost immediate, and the pain and inflammation have subsided rapidly.

¹ The solution I usually employ is Potassæ Carb. or Sodæ Carb. ʒiv to ʒvj, Liq. Opii sedativi, ʒj, Glycerini, ʒij, Aquæ Rosæ, ʒix. Sometimes, however, Decoction of Poppies is substituted for the Liquor Opii and Rose Water. Thin flannel soaked in one of these mixtures should be applied to the inflamed parts, and the whole should then be wrapped up in flannel. In all cases, however, to prove effective, the flannel must be kept *sopping wet*, not merely moist.

That the effect observed to follow these saline fomentations has not been due to accidental causes, is manifest from the result of careful experiment; for in twenty-two instances in which corresponding joints were affected, a fomentation of warm water was applied to the one joint, and an alkaline and opiate solution to the other, and almost uniformly the pain and inflammation continued in the former, and speedily subsided in the latter. Besides this, I have endeavoured to ascertain whether the occurrence of inflammation may not be prevented by impregnating the parts with alkaline matter.¹ In thirteen cases in which the knees, and in twelve cases in which the hands were in the first instance unaffected, a mixed alkaline and opiate solution was applied to one joint, and a simple water fomentation to the corresponding joint on the other side. In five of the former cases, and in three of the latter, the joint to which water only had been applied became inflamed, whilst in one instance only did inflammation occur, and that to a very slight extent, in the joint which had been bathed in an alkaline and opiate solution.² So that my experiments, though not as yet sufficiently extensive to enable me to speak decisively on the subject, have, as far as they have gone, proved extremely satisfactory.

One point yet remains to be noticed. Whilst attacking the disease both by internal and external means, it is essential to pay strict attention to the diet. The patient must be

¹ In a practical point of view, the determination of this question is not of much importance; but on theoretical grounds, as bearing upon the occurrence and possible prevention of cardiac inflammation, it is of the utmost moment.

² I am indebted to the kindness of my colleagues, Dr. Wilson and Dr. Bence Jones, for several opportunities of trying these experiments.

kept low; yet, as there is an excessive drain upon the system, it is expedient to allow him more nourishment than would be safe or proper in other inflammatory complaints. Strong beef tea and jelly may be given in moderate quantities; and with the view of supplying the waste caused by the perspiration, and of promoting the dilution and more rapid absorption of the alkaline medicines administered internally, diluents, such as whey, thin gruel, or barley water, should be taken from time to time, and especially after each dose of the medicine.

The following cases, which are placed in chronological order, will serve to illustrate my plan of treatment—

*Case 1.*¹ — William Connor, a carpenter, æt. 31, was admitted a patient of the Pimlico Dispensary on the 16th of June, 1846. He had already undergone two attacks of acute rheumatism; the first ran on in spite of treatment for a period of seven weeks; and the last, which occurred four years ago, after continuing in an acute stage nearly five weeks, was protracted in a subacute form for a period of four months. The present attack commenced on the 12th instant, and was ushered in by chilliness, followed, in the course of a few hours, by pain, heat, redness, and swelling of both wrists, the right elbow, and his left knee. The inflammation shifted rapidly from joint to joint, and when I first saw him on the 16th, his right ankle and both his

¹ For the opportunity of seeing and treating this case, I am indebted to my friend Dr. Blackall, Senior Physician to the Dreadnought Hospital Ship, and formerly Physician to the Pimlico Dispensary.

elbows were severely affected. The pain was so excessive, that he had been unable to sleep since the commencement of his attack. He was sweating profusely, the perspiration having the sour odour of rheumatism, and standing in large drops upon his forehead. Conjunctivæ yellow; tongued red at the tip and edges, and coated in the centre with a thick yellowish-white fur. Bowels reported open; urine scanty, dark-coloured, and loaded with lithates; sp. gr. 1025. Saliva extremely acid. Pulse 116, full and bounding. Heart's action regular, but its impulse somewhat increased; a loud systolic mitral murmur, probably of old standing, distinctly heard at the apex. No friction sound, and no præcordial pain.

I ordered the joints to be fomented with the opiate and alkaline lotion; restricted his diet to beef tea, milk, and gruel, and prescribed the following medicine:

R. Hydrargyri Chloridi, gr. v; Opii, gr. ij. M. ft. Pilulæ duæ
horâ somni sumendæ.

Haust. Sennæ c. Sodæ Potassio-Tart., ʒiv., cras primo mane sumendus.

Liquoris Potassæ, ℥xl;

Potassæ Tartratis, ʒij;

Vini Colchici, ℥x;

Tincturæ Opii, ℥xij;

Haust. Potassæ Citratis, ʒjss. M. ft. Haust. 4^{ta} quâque horâ
sumendus.

17th.—Passed a tranquil night, though without much sleep, and feels in every respect more comfortable to-day. Joints somewhat less swollen and painful. Tongue moist, but coated. Saliva still acid. Bowels have been moved once. Urine more plentiful (reported about 1½ pints), less loaded; sp. gr. 1028. Pulse 96. Heart's sounds the same as yesterday.

To continue the draught and fomentations as before.

To take two grains of Opium at bedtime.

18th.—Passed a quiet night, and slept nearly five hours. Joints still slightly swollen, but scarcely at all painful. Still perspires freely. Conjunctivæ yellowish. Tongue moist and cleaning rapidly. Saliva faintly acid. Bowels have not been relieved. Urine about $3\frac{1}{2}$ pints, clear, acid; sp. gr. 1026. Pulse 80, soft. Heart's action regular, and sounds just as on admission.

To repeat the medicine every six hours.

To take the pills and Senna draught, as ordered on the 16th.

19th.—Slept well, and is rapidly improving in every respect. There have been two full evacuations from the bowels; the tongue continues to clean, and is no longer red, and the urine is reported about the same as yesterday; none has been saved for examination. Pulse 76, rather weak.

To repeat the medicine twice a day, and to take a grain of Opium at bedtime.

20th.—Slept soundly last night, and to-day is free from pain and swelling of the joints, slight stiffness and uneasiness alone remaining about the right wrist. Tongue quite clean and moist. Bowels somewhat costive. Urine very abundant, clear, and acid; sp. gr. 1027. Pulse 64, and somewhat weak. Is up and dressed to-day, but feels very low.

To omit the saline medicine, and take the following:

℞. Quinæ Disulphatis, gr. ij;
Sulphatis Magnesiae, ʒss;
Acidi Sulphurici dil., ℥v;
Tincturæ Aurantii, ʒss;
Aquæ destillatæ, ʒjss. Ft. haustus bis die sumendus.

Haustus Sennæ c. Sodæ Potassio-Tart. ʒiv, cras mane.

Fish, and beef tea.

From this time he proceeded steadily to convalescence;

and on the 24th was so far improved, that he asked leave to be allowed to resume work. He was induced, however, to take the Quina for a few days longer; but on the 26th he felt so thoroughly well, that he betook himself to his ordinary occupation.

Case II.—William Made, a thin, pale, unhealthy looking boy, æt. 15, was received as a patient under my care at St. George's Hospital, on the 24th of August, 1850. He had got wet through on the morning of the 21st, and in the evening of the same day had been attacked with shivering, succeeded by wandering pains in the limbs. In the course of a few hours the pain seized upon the joints, and the right hand and wrist, the left knee and both ankles became inflamed and swollen. The inflammation, however, had shifted rapidly from joint to joint; and when I first saw him, his left hand and wrist, the right knee and elbow, and his left ankle, were the inflamed parts. He had been unable to sleep since the beginning of the attack, his complexion was sallow, the countenance distressed, and he was sweating profusely. Tongue white and furred. Bowels costive. Urine scanty, high coloured, and loaded with lithates; sp. gr. 1020. Pulse 126, full and bounding, but not strong. Heart's action regular, the sounds distinct and free from murmur. Saliva strongly acid. He had no hereditary tendency to rheumatism (?), and the present was his first attack.

The inflamed joints were at once wrapped up in flannels, soaked in a lotion formed by dissolving an ounce of the carbonate of potash in a pint of decoction of poppies; his

diet was limited to beef tea, gruel, and arrow-root; and the following medicines were prescribed:

R. Hydrargyri Chloridi,
Pulveris Doveri, āā gr. iij. M. ft. Pulvis statim sumendus.
Haustus Sennæ c. Sodæ Potassio-Tart., ʒiij, post horas quinque.
Haustûs Salini, ʒjss;
Sodæ Potassio-Tartratis, ʒij;
Vini Colchici, ʒxv;
Tincturæ Opii, ʒvij. M. ft. Haust. 6^{ta} quâque horâ sumendus.

August 25th.—Passed a tranquil night, though without much sleep, and to-day is comparatively easy. The redness has almost disappeared, and the swelling has subsided considerably. Bowels acted on twice by the medicine yesterday, and to-day have been freely moved once. Perspiration still very profuse and acid. Urine about $1\frac{1}{2}$ pints, besides what was passed at stool; acid; less high coloured and loaded; sp. gr. 1031. Tongue moist and much cleaner. Pulse 98, soft. Heart's sounds clear. Saliva still acid.

Rep. Haustus 6^{ta} quâque horâ.

R. Pulv. Ipecac. comp., gr. x;
Hydrarg. Chloridi, gr. iij. M. ft. Pulvis hâc nocte sumendus.

26th.—Slept well last night; to-day has neither redness nor swelling of the joints, and slight stiffness only remains. Still perspiring freely. Bowels have acted once. Tongue moist and cleaning rapidly. Urine reported about $2\frac{1}{2}$ pints, clear and acid; sp. gr. 1030. Pulse 86, soft. No exocardial or endocardial murmur. Saliva neutral.

Rep. Haustûs ter die tantum.

27th.—Passed another quiet night, and has no return of pain. Bowels have acted once. Tongue quite clean, except just in the centre, where it is rather white. Urine

clear, and in great abundance; sp. gr. 1030. Pulse 76, soft. Is up and about to-day.

R. Haustus Quinæ c. Acid. Sulph. dil., \mathfrak{m} xv, Sulph. Magnesizæ, \mathfrak{z} ss, bis die.

From this time he continued taking the quina until the 30th, when having had no return of pain, and feeling quite well, the medicine was discontinued.

Case III.—Samuel Bates, a porter, æt. 36, was admitted into the King's Ward of St. George's Hospital, on the 9th of September, 1850. His father was a martyr to rheumatism, and he himself, about seven years ago, underwent an acute attack of the disease which confined him to bed above two months. Nine months ago he suffered from lumbago during the space of three weeks, but on no other occasion had he experienced any symptom of rheumatism since his former illness. The present attack, which commenced on the 4th instant, was preceded for a week by loss of appetite, languor, and inability to apply himself to work. Shivering followed by fever supervened; and, in the course of twenty-four hours, several of his joints became red, swollen, and exquisitely painful. Since that time the pain and swelling have shifted repeatedly from limb to limb, and he has had scarcely an hour's sleep.

On admission, the left knee, the right foot and ankle, and the left wrist and elbow were inflamed and swollen; there was profuse perspiration of a peculiarly strong empyreumatic odour, and he complained greatly of thirst. The heart's action was regular, and the sounds were clear. Tongue furred and red at the tip and edges. Saliva acid. Bowels reported open. Urine scanty and loaded with lithates; sp. gr. 1023; pulse 126 full and strong.

The inflamed joints were fomented with an alkaline and opiate solution, and the following medicines were ordered—

R. Hydrargyri Chloridi, gr. iv ;
 Ext. Aloes Aquosi, gr. iij ;
 Extracti Colchici Acet., gr. jss ;
 Opii, gr. ij. M. ft. Pilulæ duæ statim sumendæ.
 Sodæ Potassio-Tartratis, ijss ;
 Vini Colchici, ℥xij ;
 Tincturæ Opii, ℥x ;
 Haustûs Potassæ Citratis, ʒjss. M. ft. Haustus tertiâ
 quâque horâ sumendus.

Pulv. Ipecacuanhæ, gr. xv, horâ somni.

Barley-water as a drink, beef tea and arrow-root.

September 10th.—Passed a quiet but sleepless night. Joints still inflamed, though less so than yesterday. Perspiration continues. Heart sounds clear and action regular. Pulse 110. Bowels acted last night, but have not done so to-day. Tongue less red. Saliva still acid. Urine in larger quantity ($1\frac{1}{2}$ pints) loaded with lithates ; sp. gr. 1023. Revolts at the medicine which causes excessive nausea, but has not given rise to vomiting.

Rep. Pulveris Doveri, gr. xv, horâ somni.

R. Potassæ Bicarbonatis, ʒj ;
 Sodæ Potassio-Tartratis, ʒjss ;
 Vini Colchici, ℥x ;
 Tincturæ Opii, ℥viij ;
 Haustûs Potassæ Citratis, ʒjss. M. ft. Haustus c. Acid.
 Citrici, ʒj, tertiâ quâque horâ sumendus.

Haustus Sennæ c. Sodæ Potassio-Tartratis, ʒiv, cras mane.

11th.—Slept four or five hours last night, and feels easier in every respect to-day. Still perspires profusely. No joint swollen except the knee, and that only slightly so, but the whole body feels very stiff. Heart unaffected. Pulse 84, soft. Tongue much cleaner and less red, saliva

neutral. Bowels have acted freely twice, urine clear, plentiful (about three pints), slightly acid; sp. gr. 1028. Medicine no longer gives rise to nausea.

Repet. Pulvis Doveri horâ somni.

Repet. Haustus, 4^{ta} quâque horâ.

12th.—Slept soundly last night, and has no longer any swelling or inflammation of the joints. His only complaint is of stiffness. No endocardial or exocardial murmur. Pulse 80, soft. Tongue moist and almost clean. Saliva alkaline. Bowels not open. Urine very abundant, a chamber pot full; sp. gr. 1029. Slightly alkaline from fixed alkali. Skin still perspiring, but not profusely as before.

R. Ext. Colchici Acet.,

Hydrargyri Chloridi,

Ext. Aloes Aquosi, āā gr. ij;

Opii, gr. ss. M. ft. Pilulæ duæ horâ somni sumendæ.

Repetatur haustus ter die tantum.

13th.—Passed a quiet night and slept soundly. No longer perspires. No return of pain or swelling. Complains of being hungry, and wishes to get up. Tongue clean. Bowels freely open. Urine clear, abundant, slightly alkaline from fixed alkali; sp. gr. 1030.

Repetatur haustus bis die tantum.

Fish diet.

14th.—Is up and dressed to-day. His only complaint is of stiffness of the shoulders and general weakness. Tongue clean. Bowels open. Urine slightly acid.

17th.—Quite well, but weak. Tongue clean. Bowels regular.

Omittatur haustus salinus.

R. Haustus Quinæ, bis die.

Ordinary diet, without beer.

From this time he progressed favorably. On the 24th, after walking in the garden he had slight stiffness about the shoulders, which was at once relieved by a vapour bath, and with this exception he experienced no drawback—and he remained so free from pain that it was judged safe to let him leave the hospital on the 2d of October.

Case iv.—Frank Hatcher, æt. 16, was admitted into the York Ward of St. George's Hospital, on the 27th of February, 1856. He had been seized on the 23d instant, with violent rigors, followed by wandering pains in the limbs, pain, swelling, and redness of the joints, and excessive feverishness. The pains had shifted rapidly from joint to joint, so that during the four days which had elapsed since his seizure, almost all the joints had been severely visited. He had been unable to sleep throughout, and had been constantly bathed in profuse, sour-smelling perspiration.

When I first saw him after admission, his knees, ankles, and the left wrist and elbow were inflamed, swollen, and extremely painful; he was sweating profusely, the perspiration having the peculiar acid odour of rheumatism. The pulse was 124, full, but not hard. Tongue furred and red. Saliva acid. Urine very scanty, high-coloured, and loaded with lithates; sp. gr. 1022. Bowels costive. Conjunctiva yellow. He had much thirst, and total loss of appetite. Heart's action regular, and its sounds clear. He had no hereditary tendency to rheumatism, nor had he experienced a previous attack.

Beef tea and gruel were ordered as food; barley water

was given as a beverage. The joints were fomented as usual ; and the following medicines were prescribed :

R. Hydrarg. Chloridi, gr. v ; Ext. Colchici Acet., gr. iij ; Opii, gr. ss. M. ft. Pilulæ duæ statim sumendæ.

Haust. Sennæ c. Sodæ Potassio-Tart., 3ij, post horas quatuor.

Potassæ Bicarbonatis, ʒj ;

Sodæ Potassio-Tartratis, ʒjss ;

Vini Colchici, ℥x ;

Tincturæ Opii, ℥viij ;

Haust. Potassæ Citratis, ʒjss. M. ft. Haustus 4^{ta} quâque horâ sumendus c. Acidi Citrici, ʒj.

August 28th.—The bowels acted freely after the medicine, but he has passed a restless night, sweating profusely, and the pains are still severe, but the swelling and redness are subsiding. Heart unaffected. Pulse 104, less full and bounding. Tongue much the same as yesterday. Urine much more abundant, but still loaded with lithates ; sp. gr. 1024. Saliva neutral.

Repetatur haustus 3^{tiâ} quâque horâ.

Haust. Morphiæ, ʒiij, horâ somni.

Repetatur haustus Sennæ cras mane.

February 29th.—Passed a good night, and is much better to-day. Still perspiring freely. The left knee only remains swollen, and is not very painful. Heart sounds clear. Pulse 80, soft. Tongue much less red, and almost clean. Bowels open, but not freely. Conjunctivæ rather yellow. Urine abundant, 2½ pints, clear, slightly alkaline (from fixed alkali) ; sp. gr. 1028. Saliva alkaline. Begins to ask for more food.

Repetatur haustus 4^{ta} quâque horâ.

Repetantur Pilulæ nuper præscriptæ hâc nocte.

March 1st.—Has passed a quiet night, though without much sleep. No swelling remains, and but little pain.

Heart's action regular; sounds clear. Perspiration continues, and is still acid. Bowels have acted freely. Tongue clean and much less red. Urine abundant; still rather alkaline; sp. gr. 1028. Saliva alkaline.

Repetatur haustus 6^{ta} quâque horâ.

3d.—No longer any pain. Complains of being hungry, and wishes to get up and dress. Tongue clean. Bowels regular. Urine abundant, clear, and almost neutral. Skin moist, but not bathed in perspiration as before.

Repetatur haustus.

Fish diet; to keep in bed.

5th.—Still continues free from pain. No longer perspires.

Repetatur haustus ter die tantum.

May get up and dress to-day.

From this time until the 10th the medicine was continued as a precautionary measure three times a day, but as he then remained quite free from pain, all medicine was discontinued, and ordinary diet was prescribed. With the view, however, of guarding against the recurrence of the disease, he was kept in the hospital until the 19th, when, as he was still free from any symptom of rheumatism, he was permitted to return home.

Case v.—Mary Wood, æt. 15, was admitted into Queen's Ward on the 1st of July, 1857. Six days previously she had been seized with wandering rheumatic pains, followed, in the course of twenty-four hours, by pain, redness, and swelling of the knees, ankles, and right wrist. She had never before experienced an attack, and could not account for her present seizure; but her mother admitted that she

had been "off her feed" during the previous six or eight days. Since the commencement of her illness she had been unable to obtain a "wink of sleep."

On admission, her face was pale, the skin hot, but not perspiring. Tongue furred. Saliva acid. Bowels reported open. Urine scanty, high coloured, acid, and turbid; sp. gr. 1023. Pulse 120, full and bounding. The catamenia had not appeared. The heart's sounds were free from murmur. The left knee, both ankles, and the right wrist, were hot, red, swollen, and painful.

An alkaline and opiate fomentation was ordered for the joints; and, as the skin was not acting freely, I prescribed a vapour bath in the evening. The following medicines were also given:

R. Extracti Colchici Acetici, gr. ij;
 Pilulæ Colocynth, c. Calomelane gr. viij. M. ft. pilulæ duæ
 horâ somni hâc nocte sumendæ.
 Potassæ Acetatis, ℥ij.
 Potassæ Bicarbonatis, ℥j.
 Vini Colchici, ℥viij.
 Haustus Acetatis Ammoniaë ℥iss. M. ft. haustus 4^{ta}
 quâque horâ sumendus c. Acidi Citrici, ℥j.

Beef tea.

2d.—The vapour bath acted well, and she has ever since perspired freely. No sound sleep, but dozed at intervals during the night. Pains much easier, and the joints, though swollen, are no longer red. Tongue cleaner. Bowels have acted freely. Urine plentiful, clear, slightly acid; sp. gr. 1026. Pulse 108, soft and regular. Heart's sounds clear.

3d.—Slept better last night, and has less pain than yesterday. Still perspires profusely. Tongue white, but moist, and clean at the top and edges. Bowels have not

acted. Urine abundant, alkaline; sp. gr. 1026. Pulse 84, soft. Heart's sounds clear.

Repetatur haustus ter die tantum.

Repetantur pilulæ hæc nocte.

4th.—Slept tolerably well last night. Has still some uneasiness in the right knee, but in no other part of the body. Bowels have acted freely. Tongue almost clean. Urine still alkaline, about $2\frac{1}{2}$ pints; sp. gr. 1026. Pulse 72, weak. The last dose of the medicine made her vomit.

R. Tincturæ Guaiaci Ammon., ʒj;
Potassæ Acetatis, ʒss;
Liquoris Potassæ, ʒss;
Haustus Cinchonæ, ʒxss. M. ft. haustus ter die sumendus.

Fish and beef tea.

From this time her progress towards recovery was steady and rapid. On the 7th I deemed it safe to prescribe meat; on the 9th she was permitted to get out of bed and dress; and on the 16th, as she remained quite free from pain, she was allowed to leave the hospital.

Case VI.—Timothy Suter, æt. 29, was admitted into the Hope Ward of St. George's Hospital on the 2nd of July, 1859. A groom by occupation, he had been somewhat languid, but not notably out of health until five days prior to his admission, when he was seized with wandering rheumatic pains, and swelling of the larger joints. Feverish symptoms then ensued; he lost his appetite, became restless and unable to sleep at night, and began to perspire profusely. The present was his first attack, and it was not preceded by rigors.

I saw him first the day after admission, when his face was flushed, the conjunctivæ were yellowish, the skin was hot, and

perspiring profusely, the perspiration emitting a strong empyreumatic odour; tongue coated and rather dry in the centre, saliva acid, bowels reported costive, urine scanty, high-coloured, and charged with lithates; sp. gr. 1021. Pulse 110, regular, full, and bounding. The wrists, elbows, knees, and ankles were all much swollen, red, and exquisitely painful. He was complaining of pain in the region of the heart, and a systolic aortic murmur was audible at the base.

As the pulse was regular, and the other symptoms did not appear to indicate *active* mischief about the heart, I merely ordered the joints to be fomented as usual, and prescribed the following medicines:

- R. Extracti Colchici Acetici, gr. ij;
 Pilulæ Colocynth c. Calomelane, gr. viij. M. ft. pilulæ duæ
 horâ somni hâc nocte sumendæ.
 Potassæ Bicarbonatis, ℥iss.
 Sodæ Potassio-Tartratis, ℥ij;
 Vini Colchici, ℥x;
 Haustus Acetatis Ammonia, ℥ij. M. ft. haustus 4^{te}
 quâque horâ sumendus c. Acidi Citrici, ʒj.

Beef tea.

4th.—He had passed a restless night, but his joints were no longer red, and were less swollen and much less painful. The bowels had not acted. Tongue furred, yellowish, and somewhat dry in the centre. Urine about a pint and a-half, sp. gr. 1024, acid, no longer loaded with lithates. Perspiration still profuse. Pulse 96, regular. Heart's sounds as before.

The mixture was ordered to be repeated, and the following medicines were also prescribed:

- Hydrargyri Chloridi, gr. iij; Opii, gr. j. M. ft. pilula
 statim sumenda.
 Haustus Sennæ c. Sodæ Potassio-Tartratis, ℥iv; post horas
 tres.

5th.—The bowels acted freely after the senna, and he slept at intervals throughout the night. The joints are far less swollen and painful, so that he can move in bed without assistance. Tongue moist and coated, but cleaning at the edges. Bowels open. Urine still acid, but clear; more abundant, about $2\frac{1}{2}$ pints; sp. gr. 1028. Pulse 92, soft and regular. Heart's sounds as before, but murmur less loud.

Repetatur haustus 4^{ta} quâque horâ.

6th.—Passed a fair night, and has not much pain remaining. Still perspires freely. Tongue much cleaner. Bowels rather relaxed. Pulse 80, soft and regular; urine clear, but alkaline. Its amount could not be ascertained, as so much was passed at stool. Heart's sounds as before.

Repetatur haustus ter die tantum.

7th.—Slept soundly, and feels quite well to-day. No longer any pain. Tongue cleaning. Bowels freely open. Urine abundant, turbid, alkaline. Pulse 76, weak.

Repetatur haustus bis die tantum.

Fish and beef tea.

9th.—No return of pain. Tongue nearly clean. Urine still slightly alkaline. Is up and dressed to-day.

Omittatur haustus salinus.

R. Haustus Quinæ c. Sulph. Magnesiæ, ʒss; bis die.

10th.—Continues well.

Ordinary diet.

A systolic murmur still remained at the base of the heart, but it was very slight, and soft in character. In other respects he was quite well, and he was therefore permitted to leave the hospital on the 13th of July.

The cases above detailed afford sufficient illustration of the effects produced by the plan of treatment above laid

down. Its influence over the pulse and the urinary secretion is seen to be most rapid and striking, as is also its power of subduing the pain and arresting the progress of the inflammation.

In *Case I*—*The pulse* fell from 116 to 80 within 48 hours, and to 76 on the third day.

„ *The urine*, from being scanty and loaded, became plentiful and less loaded within 24 hours; and still more abundant and clear, sp. gr. 1026, in 48 hours.

„ *The inflammation of the joints* was almost subdued at the expiration of 48 hours, and subsided altogether by the fourth day.

In *Case II*—*The pulse* fell from 126 to 86 in 48 hours, and to 76 on the third day.

„ *The urine*, from being scanty and loaded, became abundant and less loaded in 24 hours, and still more abundant and clear, sp. gr. 1030 in 48 hours.

„ *The articular inflammation* was greatly relieved within 24 hours, and subsided altogether within 48 hours.

In *Case III*—*The pulse* fell from 126 to 110 in 24 hours, and to 84 within 48 hours.

„ *The urine*, from being scanty and loaded with lithates, became much more abundant on the second day; and very plentiful and clear, sp. gr. 1028, on the third day.

„ *The inflammation of the joints* began to subside within 24 hours, and had almost wholly ceased within 48 hours.

In *Case iv*—*The pulse* fell from 124 to 104 in 24 hours, and to 80 in 48 hours.

„ *The urine*, from being very scanty, high coloured, and loaded with lithates, sp. gr. 1022, became much more abundant. sp. gr. 1024, in 24 hours; and very plentiful and clear, sp. gr. 1028, in 48 hours.

„ *The pain, redness, and swelling of the joints* were much reduced in 24 hours, and were altogether subdued within three days.

In *Case v*—*The pulse* fell from 120 to 108 in 24 hours, and to 84 in 48 hours.

„ *The urine*, from being scanty, high coloured, and turbid, sp. gr. 1023, became much more abundant, clear, and only slightly acid, sp. gr. 1026, in 24 hours, and still more abundant, alkaline, sp. gr. 1026, in 48 hours.

„ *The articular inflammation* was greatly reduced within 24 hours, and subsided altogether within three days.

In *Case vi*—*The pulse* fell from 110 to 96 within 24 hours, to 92 within 48 hours, and to 80 within 72 hours.

„ *The urine*, which at first was scanty, charged with lithates, sp. gr. 1021, increased in quantity, and became almost clear within 48 hours, and still more abundant and quite clear, sp. gr. 1028, on the third

day; on the fourth day it became alkaline.

„ *The articular inflammation* was considerably reduced by the end of the third day, and had subsided altogether by the end of the fourth day.

These results must not be regarded as exceptional in their character. The cases have been selected, not on account of their favorable issue, but as average examples offering good illustrations of the acute disease, and of the means employed to subdue it.

On analysing 168 cases which I have treated, after the plan above detailed, I find that 31 were accompanied by symptoms of endocardial or exocardial inflammation; but that in 5 only, did such symptoms manifest themselves after the commencement of treatment, and *that* before the full effect of the remedies could be felt. Excluding these 31 cases, the pulse in 34 instances fell between 20 and 30 beats within thirty hours, and to the same extent within forty-eight hours in 72 others; in 16 it was not subdued to such an extent until the expiration of three days; in 5 not until the fourth day; in 2 not until the fifth day; and in 4 not until the sixth day of treatment. In 4 cases the precise frequency of the pulse after the first forty-eight hours was not noted. In 122 instances it had fallen below 92 before the expiration of the third day of treatment.

There was a great increase in the quantity of the urine by the end of twenty-four hours in 39 cases, by the end of forty-eight hours in 56 cases, and by the end of the third day in 10 cases; whilst in 3 instances in which diarrhoea supervened, the urine remained scanty until after the complete subsidence of the disease. In 29 cases the urine was

not saved, and therefore the quantity voided could not be ascertained.

In 37 cases the urine became clear within twenty-four hours, in 51 within forty-eight hours, in 13 within three days, in 5 within four days, and in 2 on the fifth day. In 29 cases the urine was not saved; and, therefore, this point could not be determined. In several of these it probably remained turbid for a longer period.

It lost its acidity, and became either alkaline or neutral, within twenty-four hours in 14 instances; on the second day, in 44 instances; on the third day, in 12 instances; on the fourth day, in 15 instances; and subsequently to that period, in 4 instances. In 19 instances it never altogether lost its acidity, and in 29, as the urine was not saved, the fact could not be ascertained.

The pain was relieved, and the articular inflammation greatly subdued within twenty-four hours in 54 cases, within forty-eight hours in 56 other cases, within three days in 15 cases, within four days in 9 cases, and within five days in 3 cases.

The articular inflammation subsided altogether within twenty-four hours in 7 instances, within forty-eight hours in 26 instances, within three days in 33 instances, within four days in 20 instances, within five days in 13 instances, within seven days in 14 instances; and in the remaining 24, although it did not wholly subside until a later period, yet it did not display any symptoms of activity after the fourth day.

In 7 instances only did the medicine produce any disagreeable effect. In all these it gave rise, in the first instance, to nausea, and in 2 to occasional vomiting. In 3 of these 7 cases the nausea subsided after the first few doses; in the other four, which were among those in which

the articular inflammation was not wholly subdued until the end of the seventh day or afterwards, the salines had to be omitted, not only on account of the continued nausea, but because of their purgative action. These were invariably the cases in which the remedial power of the salines was least strikingly displayed; and I cannot help thinking that the want of success depended, as in many of the cases treated by lemon juice, upon the absence of a sufficiently active converting power in the system. The salt was not assimilated and decomposed, and therefore did not act as an alkali, but accumulated in the system and operated as a purgative. This at least is certain, that in the cases alluded to, it exercised far less control than usual over the acidity of the secretions, and failed to produce much action as a renal depurant.

The only uncertainty attaching to any of the above-stated results, is that arising from the difficulty in arriving at a correct conclusion respecting the quantity of urine passed. In no case can this be ascertained with accuracy, as it is often impossible to catch the urine which is voided at stool by a patient labouring under acute rheumatism. In every instance, however, great care was taken to obtain as close an approximation to the truth as possible.

In 89 cases, not only was the quantity of urine increased, but its solid constituents, as shown by its increased specific gravity, were also greatly augmented. In 14 of the other 19 cases, although the urine increased in quantity, there was only a slight corresponding increase in its specific gravity, and in 5 the specific gravity was slightly diminished. This variation in the quantity of the solid matters excreted by the kidneys, was attributable, I believe, not to any difference in the quantity of the morbid matter present in the system, but to the varying activity of the

cutaneous and intestinal secretions, whereby it happened that in certain cases a far larger amount of matter was carried off by those channels than could be so got rid of in others.

CHAPTER VI.

ON THE CAUSES OF RHEUMATIC AFFECTION OF THE HEART.

My remarks on acute rheumatism have been hitherto confined to cases in which pain, redness, and swelling of the joints constitute the only local manifestations of the disease. These external symptoms were long regarded as making up the sum and substance of the complaint, the very existence of its internal complications having been unsought for and undiscovered. But clinical observation and pathological research have now unfolded changes in the internal organs of the deepest import; they have discovered the important and fearful fact that, accompanying the paroxysm of rheumatic fever, there may be not only articular redness and swelling, but inflammation of the lining and investing membranes of the heart,—inflammation of an organ, the mechanism of which is most easily deranged, and which, when deranged, “lays its own hard conditions upon the continuance of a man’s life, and almost settles beforehand the manner of his death.”¹

Inflammation of the heart is now recognised as imparting to acute rheumatism its chief danger and perplexity. Does a patient die during the first violence of the attack? his

¹ Dr. Latham’s ‘Clinical Medicine,’ p. 156.

death is almost invariably attributable to inflammation of this organ. Does he apparently recover and resume his wonted avocations? he is taught, alas! at no distant period, that there is yet in store for him a frightful amount of suffering, a long continuance of asthma, palpitation, and dropsy, as the result of his former cardiac affection.

Such being the dangers, and such the suffering attaching to rheumatic cardiac affection, it behoves us to investigate the cause of its occurrence, the class of cases in which it is most liable to arise, and the possibility of guarding against its invasion.

The first question which arises is as to the *cause* of its occurrence. On what does rheumatic inflammation of the heart depend?¹

It was formerly supposed to be due to metastasis, or, in other words, to the retrocession of the disease from the external parts, and its consequent transfer to the membranes of the heart. But more recent and more extended observation has shown that endocardial or exocardial inflammation may occur as the first, and, for some time, the only local symptom of the disease;² that it sometimes *precedes*, by

¹ Throughout this Chapter, I make use of the expressions "inflammation of the heart" and "cardiac inflammation," as applying indifferently to inflammation of the endocardial or exocardial membranes.

² Five instances of this sort have fallen under my own observation. In two cases the patient laboured under pericarditis two days, in another three days, and in another five days, prior to the appearance of articular inflammation; whilst in another, the case recorded at p. 324 of this Treatise, the heart appears to have been attacked seven days before rheumatism manifested itself externally. My colleague, Dr. Wilson, has recorded another very striking case in point, in the 'Lancet' for November, 1844, vol. ii, p. 217. Dr. Dundas, Physician to the Northern Hospital, at Liverpool, has favoured me with

several days, the access of articular redness and swelling, and that even in cases where it does not take place until after inflammation of the joints has been set up, it is rarely preceded or accompanied by subsidence of the previously existing articular mischief. In other words, it has shown, that, in the great majority of cases, no connection can be traced between the two sets of actions, beyond their origin in one common source of mischief,—in one poison which excites inflammation, now at one spot, now at another; at one time attacking several joints simultaneously or in succession, and then the investing or lining membranes of the heart; at another, reversing the order of its attack, and exciting inflammation first of the heart and then of the articular structures. Hence, although rheumatic inflammation of the heart may possibly be connected, in some rare instances, with the sudden subsidence of articular inflammation, and the transfer of irritation from the external parts, it must be regarded, in most instances, as a mere coincidence, and as an extension of the local manifestations of the disease.

I have thought it right to be thus explicit in stating my conviction as to the true pathology of this disease, because a clear and full understanding on this point is essential to

the particulars of another: one is quoted in Dr. Graves's '*Clinical Medicine*,' ed. 2, vol. ii, p. 160; one by Dr. Watson, in his '*Practice of Physic*,' vol. ii, p. 284; one by Dr. Hope, in his '*Treatise on the Heart*,' ed. 3, p. 178; one by Dr. Duncan, in the '*Edinburgh Med. and Surgical Journal*' for 1816; one by M. Hache, in the '*Archives Générales de Médecine*,' vol. ix, p. 325; and two others by Dr. Taylor, of Huddersfield, '*Medico-Chir. Trans.*,' vol. xxviii, p. 527. Some interesting remarks on this subject are to be found in the '*Edinburgh Monthly Journal*,' 3rd series, vol. xvi, p. 45; and others are recorded in various medical periodicals.

a correct appreciation of many circumstances having an immediate and practical bearing on the questions at issue, namely, the class of cases in which cardiac inflammation is most liable to arise, and the possibility of guarding against its occurrence. If, as I believe, it is annexed to the same pathological condition of the system, and arises from the same cause as inflammation of the joints, it is fair to presume that much important information respecting it may be obtained by a close observation of the circumstances which influence the articular inflammation. If, like the external redness and swelling, this internal inflammation be due to the irritation of a *materies morbi* present in the blood, and circulating with it to every part of the body, then we may infer that those causes which determine the access of inflammatory action about the joints, and which modify its course, will, in this case also, exert a controlling or modifying power.

What, then, are the facts with regard to the articular inflammation?

It occurs most frequently and most extensively in cases remarkable for the severity of their general symptoms; in which, therefore, there is great abundance of the *materies morbi*, or a state of system peculiarly susceptible of its influence. It does not attack all the joints indiscriminately, but selects different joints in different cases; those which are most used, or which have been the seat of injury or irritation, being more than ordinarily liable to its invasion. It attacks a larger number of joints, and is more likely to invade any particular joint, in proportion as the local symptoms are more migratory; and, lastly, it may be in great measure prevented and subdued, by the use of alkaline and opiate fomentations, and by the exhibition of medicines which serve to counteract the rheumatic poison, to promote its

elimination, and to prevent its further formation.¹ Hence it appears that cardiac inflammation should occur most frequently in cases characterised by great febrile disturbance, and by the number and intensity of the articular inflammations; that as in most attacks of acute rheumatism some joints usually escape unscathed, so also the heart should sometimes remain unaffected throughout; that it should be most liable to be attacked when the local symptoms of the disease are shifting or migratory, and when, either from some constitutional peculiarity or from extraneous and temporary causes, its irritability is unusually exalted; and that it should be protected by the exhibition of such medicines as are calculated to exercise a sedative influence over it, to counteract or destroy the irritant property of the rheumatic element, and to promote its elimination from the system.

Some difference of opinion has been expressed as to the existence of any peculiar proneness to heart-disease among the severer examples of acute rheumatism, and no less authorities than Dr. Latham and Dr. Watson have stated, that "Pericarditis is not more to be looked for when the disease (rheumatism) is severe than when it is mild." If, by this assertion, they mean that pericarditis is not invariably an accompaniment of severe articular rheumatism, and occurs not unfrequently when the articular symptoms are slight, or altogether absent, I entirely concur in their opinion. But it is quite inconsistent with my observation to believe that it *often* occurs in cases which are not characterised by active symptoms of disease. Whenever I have met with it, even though the articular inflammation may have been slight or evanescent, the febrile disturbance has always

¹ For illustrations of this fact, see Cap. V, pp. 119-138 of this Treatise.

been severe, and accompanied by profuse and sour-smelling perspiration. As many as 114 out of the 130 cases of recent heart affection observed among the rheumatic patients admitted into St. George's Hospital during the time I held the office of Registrar, occurred in the acute form of the disease; and taking pericarditis alone, 39 cases were noted among the class of acute rheumatism, and 2 only among the subacute; the number of patients in the respective classes being 246 and 133. In other words, these cases show that whereas pericarditis occurs once in about every 6·3 patients suffering from *acute* rheumatism, it does not accompany above one in every 66·5 cases of the subacute form. Nor is the result of my experience inconsistent with that of other observers. Amongst 114 cases of articular rheumatism recorded by M. Bouillaud, there were 74 of great or medium intensity, and 40 of a slighter description; and among the first there occurred 64 in which the existence of pericarditis or endocarditis was certain, and 3 in which it was doubtful, whilst among the 40 of the second class its existence was only once discovered.¹ Dr. Macleod, without giving any statistics on the subject, says, very decidedly, "according to my experience the heart affection is more frequent in severe than in mild cases of rheumatism."² Dr. Copland is of the same opinion;³ Dr. Wm. Budd believes "that rheumatic inflammation of the heart is most common in severe cases, especially when there is much fever, and the parts affected are numerous;"⁴ and Dr. Barclay, my successor as Medical Registrar at St. George's Hospital,

¹ 'Traité Clinique du Rheumatisme,' Preface, p. 12.

² On 'Rheumatism,' p. 45.

³ 'Medical Dictionary,' vol. ii, p. 195.

⁴ 'Library of Medicine,' vol. v, p. 199.

states that "until very recently, he had never seen inflammation of the heart *commence* in the subacute form of the disease.¹"

Every fact, then, in regard to rheumatic inflammation of the heart, is strictly in accordance with what we are led by analogy to expect. In many instances the heart remains unaffected throughout the attack, and though it does sometimes suffer, even in the milder cases, it is most commonly damaged in those instances which are marked by unusual severity of their general symptoms, by the number and intensity of the articular inflammations, and by the rapidity and frequency of their migration.

So far the analogy is complete. The next question to be decided is, in what cases and under what circumstances the heart's irritability is greatest, and whether it is in such that the risk of inflammation in that organ is most imminent?

Experience and observation have long since supplied abundant data for a solution of this problem. It is notorious that, in youth, the heart's action is not only quicker than in more advanced life, but is also much more readily accelerated. In women, in like manner, the heart is acted on more readily than in men, or, in other words, is more irritable, and more easily excited. In those persons, again, who have been weakened by illness, or by large and repeated bleedings,² and in those peculiar states of system which are marked by a deficiency of red globules in the blood, the heart's irritability is much increased, and palpitation is readily induced. These, then, are the cases, theo-

¹ 'Med.-Chir. Trans.,' vol. xxxv, *note*, p. 14.

² The experiments of Messrs. Andral and Gavaret, recorded in the 'Annales de Chimie,' vol. lxxv, prove most conclusively, that bleeding diminishes the number of corpuscles to a remarkable

retically at least, in which cardiac inflammation should be most liable to arise. And so in practice they are found to be. It is now generally admitted that inflammation of the heart is a much more frequent concomitant of acute rheumatism, when occurring in youth, than when occurring in those more advanced in years.¹ Statistical observations have shown that it is more common in women than in men;² and I have always been struck, both in private practice and in the wards of St. George's Hospital, by the frequency of its occurrence in the pale and weakly, in those who have been reduced by previous illness, or exhausted by the treatment adopted, and, *cæteris paribus*, in those in whom the heart's action is particularly accelerated. Indeed, I believe that after carefully weighing these several circumstances, after considering the age and temperament of the patient, his previous condition, the violence of the attack, the state of the pulse, and the plan of treatment about to be adopted, it is possible to predict with tolerable certainty the occurrence or non-occurrence of cardiac inflammation.

extent, and in that respect brings the blood into a condition resembling the blood in anæmia, in which the heart is peculiarly irritable. Three of these experiments give the following results :

		1st Bleeding.	2d Bleeding.	3d Bleeding.	4th Bleeding.
Amount of globules in 1000 parts of blood	Case i.	114·8	111·0	102·8	88·7
	„ ii.	125·3	124·9	121·4	99·6
	„ iii.	123·7	120·7	112·8	101·0

Messrs. Becquerel and Rodier also sum up the result of their experiments by stating “the effect of venesection is to cause a great diminution of the corpuscles, while it only slightly lessens the amount of albumen.” (Simon's ‘Chemistry,’ vol. i, p. 250.)

¹ Dr. Watson, Dr. Macleod, Dr. Todd, and others, bear witness to this important and significant fact.

² See Cap. IX, of this Treatise, p.280-4.

It would appear, then, that whenever the heart's irritability is great, the rheumatic poison must be peculiarly prone to attack that organ on the same principle as it is to invade a joint which has been previously strained, or is constantly used ; and, therefore, that anything which tends to augment the heart's irritability, must tend, *pro tanto*, to render the patient liable to heart affection ; whilst anything having an opposite tendency must serve, in some measure, to shield him from such a complication. Hence, although a moderate venesection may be necessary sometimes for the relief of local symptoms, and for the purpose of facilitating the action of remedies, yet excessive bleeding, by inducing irritability of the heart, cannot fail to predispose to cardiac affection ; excessive purgation must, for the same cause, have a similar effect, and so must everything which has a like tendency. On the other hand, alkalies, freely administered, by correcting the morbid condition of the blood, and promoting the elimination of the materies morbi, directly tend to obviate inflammation by removing its cause, whilst with opium, colchicum, and other medicines, they exert a sedative influence over the heart, and thus, in some measure, protect it from danger.

In thus enunciating my views on the subject under consideration, I have purposely avoided discussing the oft-mooted question, as to whether a proneness to inflammation of the heart may, or may not, be induced by venesection. A discussion of this sort cannot be decided by reference to any moderate number of cases, and but little if any good can result from an inquiry based upon uncertain and questionable grounds. I have, therefore, contented myself with pointing out those facts which have appeared to me most interesting and suggestive ; and it need only be stated, that by applying the inferences from these facts to practice,

results have been obtained far exceeding in importance my most sanguine expectations. Not only has the pain been subdued, and the course of the articular inflammation arrested with unusual certainty and rapidity, but in almost every instance the accession of inflammation of the heart has been prevented.

The treatment which has proved most efficient for this purpose, is that which is directed against the pathological condition of the system, out of which arises the tendency to inflammation, whether of the heart, the joints, or other parts of the body; which aims at neutralizing or counteracting the irritant property of the rheumatic poison, at promoting its elimination and preventing its further formation; and which, at the same time, keeps steadily in view the possibility of affording protection to the heart by a strict avoidance of everything likely to increase its irritability, and by the administration of such medicines as are calculated to exercise a sedative influence over it. Among 168 patients whom I have treated for rheumatic fever since I first adopted this plan of treatment, inflammation, whether of the pericardium or endocardium, has occurred in only 31 instances, and in 26 at least, of these, the heart was affected before the patient came under my care. In 2 of the other 5 cases, an exocardial murmur, which was not discovered when I first saw the patient, was distinctly heard on the second day, and may possibly have existed in an incipient state, though it escaped detection, on the first day of treatment; in 2 others, an endocardial murmur was first noticed on the second day of treatment, and in the other, which is the case detailed at p. 320, an endocardial murmur manifested itself on the third day of treatment. In that case, however, I had only seen the patient once before the commencement of the cardiac mischief, and I

had reason to believe the medicine had not been taken regularly. In no other instance did cardiac inflammation arise after the second day of treatment, or, in other words, after the patient had been forty-eight hours under the influence of the remedies.

Inflammation, however, is not the only form of disease from which the heart is apt to suffer in rheumatism. Every one who has watched the post-mortem examinations at any of our large public hospitals, must have remarked the close connection subsisting between rheumatism and the formation of fibrinous vegetations on the valves and on the lining membrane of the heart. By common consent this cardiac affection has been ascribed to endocardial inflammation, and its presence has been cited as conclusive evidence of the existence of endocarditis at some former period. Observation, however, has led me to take a different view of the matter, and to consider that these fibrinous deposits, though common accompaniments of rheumatic endocarditis, are, nevertheless, essentially independent of endocardial inflammation, and may and do take place without its concurrence.

The grounds on which this opinion is based, may be briefly stated. Foremost among them is the frequent occurrence of valvular murmurs, dependent on organic mischief, in cases which do not present any symptoms of true cardiac inflammation. Thus, frequently during the active stage of rheumatism, and sometimes during recovery from the disease, whilst the tongue is cleaning, and the various symptoms are gradually subsiding, a valvular murmur commences, increases steadily, and persists after the patient's recovery. That in many of these cases the murmur is not attributable to inflammation, properly so called, seems indicated by the absence of those general and local signs of

inflammation which are usually found to accompany endocarditis;¹ that it is caused by organic mischief, is often rendered probable by the position of the sound, which is clearly traced to the mitral orifice, and is proved by its persistence long after all symptoms of rheumatism have passed away; and that, in some instances at least, it is due to the deposit of fibrin on the valves, independently of active valvular inflammation, is manifest from the result of post-mortem examination. Indeed I have myself met with two cases in which the valves, though neither red, swollen, nor thickened,—though not presenting any trace, however faint of true inflammation, were yet loaded with a crop of recent fibrinous vegetations.² On the other hand, it is certain that, in some instances at least, no *unusual* effects result from endocarditis, for I have seen three examples of that disease, marked during life by all the ordinary local and general symptoms of inflammation, and exhibiting, after death, unmistakeable evidences of inflammatory action, such as minute capillary injection, with a swollen condition of the valves and effusion of lymph on their surface, in two of which there was no trace whatever of fibrinous deposits,

¹ That endocarditis may be, and is sometimes unaccompanied by pain, and by other of the ordinary symptoms of inflammation, is admitted, but it is utterly inconsistent with our knowledge of the effects of inflammation in other parts of the body, to suppose that endocarditis is unattended by active symptoms of inflammation, so frequently as the valvular murmurs which arise in the course of acute rheumatism would, if always referable to inflammation, lead us to suppose.

² One of these was a case of pericarditis and pleurisy, which proved fatal on the third day after the commencement of the valvular murmur; and one was a case of old-standing heart disease, which proved suddenly fatal, about a week after the commencement of a systolic aortic murmur.

and in the third of which the slightest possible amount of deposit existed in the shape of small beads along the edges of contact of the valves. Dr. Ormerod has also recently quoted a case, related by Dr. Kirkes, of true rheumatic endocarditis, in which the valves were distinctly swollen and vascular, and yet were unencumbered by fibrinous growths.¹ He has also favoured me with the particulars of another, in which a similar condition was observed. As then, at one time, recent fibrinous vegetations are found in great luxuriance on valves which present no traces of inflammatory action, and at another, extensive valvular inflammation is seen to exist without the concurrence of such lesions, the conclusion seems forced upon us, that valvular inflammation and fibrinous accretions, though often coexistent phenomena, are yet essentially independent of one another. Indeed Dr. Hope's experiments on the ass have shown, that fibrinous vegetations are not necessarily connected with inflammation at the spot where their formation is observed; and Mr. Simon's more recent experiments not only lead to the same conclusion, but render it highly probable that their occurrence is connected with hyperfibrinization of the blood.² Yet further, the recent and very valuable observations of Dr. Richardson³ leave little room for doubt that the absence of a due quantity of ammonia in the blood will of itself lead to a separation of the fibrinous element without the concurrence of local inflammation. Thus again we are directed to simple deposition from the circulating fluid in explanation of the phenomena in question. Nor does

¹ 'Gulstonian Lectures,' for 1851, p. 29.

² 'Lectures on General Pathology,' by John Simon. London, 1850.

³ See the Astley Cooper Prize Essay for 1856.

such an occurrence appear improbable, when we consider the close relationship of the endocardium and the blood; for what supposition can be more reasonable than that some change may be effected in the blood in immediate contact with the irritated membrane, and that fibrin may be deposited in consequence? If under any circumstances the deposition of fibrin be possible, what can be more likely than that such a deposit should take place in acute rheumatism when the blood is surcharged with the material in question, and when, from the extreme acidity of the system, it is in a state ill calculated to hold it in solution?

That these fibrinous deposits are connected with some abnormal condition of the circulating fluid seems indicated by a fact I have long remarked, namely, that they are almost entirely confined to cases accompanied by acute and wide-spreading inflammation, and by other circumstances which are not only productive of unusual quantities of fibrin in the blood, but probably impair its solubility.¹

¹ During the time I held the office of Medical Registrar at St. George's Hospital, I observed, that although every other form of valvular disease occurred not unfrequently without any previous or concurrent inflammation, yet, that no deposit of fibrin was ever found, except where there either was or had been rheumatism, or some extensive inflammation, which equally with rheumatic inflammation implies an abnormal condition of the blood, and is calculated to increase the quantity, if not to impair the solubility of the fibrin. From the statistics which have been since published by my friend, Dr. Barclay, who succeeded me as medical registrar of the hospital ('Medico-Chir. Trans.,' vol. xxxi), a further confirmation of my views may be deduced, for in every instance in which fibrinous deposits were found on the valves there either existed or had previously existed some such mischief. This will be seen on reference to the subjoined facts. Out of 75 cases of valvular disease

And since it has been proved by direct experiment that when a tendency to the deposit of fibrin exists, the fibrinous accretions are most apt to occur on anything projecting into the arterial current; and further, that they are especi-

examined after death at St. George's Hospital, 21 were instances of fibrinous deposits. The history of these 21 cases is as follows:

- | | | | |
|-----|---|--------------------------------|---|
| 1. | { | Recent Rheumatic Fever. | Recent Pericarditis, Pleurisy, and Pneumonia. |
| 2. | | Old Rheumatic Fever. | Recent Pleurisy, and adhesions resulting from a former attack of Pleurisy. |
| 3. | | " " | Recent Pericarditis. |
| 4. | | " " | Pneumonia. |
| 5. | | " " | Recent Pericarditis, and adhesions resulting from a former attack of Pericarditis. |
| 6. | | " " | Recent Pericarditis, Pleurisy, and Pneumonia. |
| 7. | | " " | Recent Pericarditis, and Pleurisy. |
| 8. | | " " | Old adhesions resulting from former attacks of Pleurisy and Pericarditis. |
| 9. | | " " | Pneumonia, and adhesions resulting from former Pleurisy and Pericarditis. |
| 10. | { | Rheumatic Fever, doubtful. | Pneumonia and Inflammation of the Brain. |
| 11. | | " " | Pneumonia and recent Pericarditis. |
| 12. | | " " | Adhesions, the result of a former attack of Pleurisy. |
| 13. | { | No mention of Rheumatic Fever. | Adhesions, the result of a former attack of Pleurisy. Diseased Kidneys. |
| 14. | | " " | Recent Pericarditis, Pleurisy and Pneumonia, and adhesions, the result of former Pericarditis. Mottled Kidneys. |

ally prone to beset those spots where irritation has been excited,¹ we cannot be surprised that they should take place on the valves in which, from the very nature of the case, the effects of irritation are most likely to be felt. Indeed the correctness of this interpretation is attested by their almost invariable occurrence on that side of the valve against which the current of the blood is directed; as, for instance, on the auricular surface of the mitral valve and the ventricular surface of the aortic valves, as also by the fact that they most abound, if indeed they be not confined, as they sometimes are, to the angular projections and the edges of contact of the valves, which are the parts most subjected to tension and pressure. If endocarditis be set up during the existence of a state of blood characterised, as the blood in acute rheumatism is, by the presence of unusual quantities of fibrin, the deposit of that material at the seat of inflammation is an event in the highest degree

15.	No Rheumatic Fever.	Pneumonia.
16.	„ „	Recent Pleurisy, with excessive congestion of the Lungs, and adhesions, the result of former Pleurisy. Diseased Kidneys.
17.	„ „	Recent Pericarditis. Diseased Kidneys.
18.	„ „	Pneumonia, and adhesions resulting from former attacks of Pleurisy and Pericarditis. Diseased Kidneys.
19.	„ „	Recent Pleurisy, and adhesions resulting from a former attack of Pleurisy.
20.	„ „	Recent Pericarditis.
21.	„ „	Adhesions resulting from a former attack of Pleurisy.

¹ See the account of Dr. Hope's experiments on the ass.

probable ; and even if there be no endocardial inflammation, the formation of such a deposit on the strained and excited valvular apparatus can hardly be regarded as improbable.¹

A further confirmation of the opinion I have advanced, is derived from the extraordinary difference in the frequency with which inflammation of the lungs accompanies the various forms of rheumatic heart affection. Thus, in rheumatism complicated by endocardial affection only, inflammation of the lungs or their membranous envelopes has occurred once in every ten cases, whereas it has been observed in rather more than half the cases attended by pericarditis, and in rather more than two thirds of those marked by endo-pericarditis.² The pulmonary inflammation is certainly due to the same cause of irritation as the cardiac inflammation, and the inflammation on the internal surface of the heart to the same as that on the external. If, then, the organic valvular murmurs be in all cases referable to endocardial inflammation, the difference in the frequency with which pericarditis and endocarditis are

¹ Dr. Ormerod considers these growths to be the offspring of inflammation, but he is obliged to admit that "deposition from the blood is a process which may, and very often does take place ; and as any roughness on the surface of a valve would be likely to attract fibrin from the passing blood, even in a healthy individual, such an event might yet more readily ensue in a case where the blood has already a strong tendency to deposit fibrin. Such is the case in acute rheumatism, as appears not only from the analysis of the blood, but from the large inflammatory exudation into the pericardium or pleura, which occurs coincidently in some such cases." ('Gulstonian Lectures,' for 1851, p. 30.)

² For full particulars on this subject, see p. 317, of this Treatise.

respectively accompanied by inflammation of the lungs, does not admit of satisfactory explanation. Whereas, if my view as to the origin of these murmurs be correct, and the valvular mischief be in many cases occasioned by the deposition of fibrin occurring independently of active endocardial inflammation, the apparent inconsistency is at once explained. And it is rendered probable that the variation observed in the proportion which pulmonary inflammation bears to the different classes of heart affections, may serve to indicate, with tolerable accuracy, the frequency with which valvular mischief arising in the course of rheumatism is referable to other cases than true endocardial inflammation.

By some persons, the frequent coincidence of pericarditis and inflammation of the lungs or their investing membrane has been referred to the close proximity of the inflamed parts, inflammatory action having a tendency to spread by contiguity of structure. But many years' observation in the dead-house of St. George's Hospital has taught me to attach very little weight to such a supposition, and has induced me to believe that as inflammation, when affecting the lungs, very rarely spreads to the pericardium, so inflammation of the investing membrane of the heart has very little tendency to spread either to the endocardium or to the lungs, and that when such an action is set up in either or both of such parts coincidently with or during the progress of pericarditis, it is usually caused by the same agency which induced the original attack of inflammation.¹

¹ The following statistical record of 265 cases of recent pneumonia, pleurisy, or pleuro-pneumonia, which occurred in St. Bartholomew's Hospital, and with which I have been favoured by my friend Dr.

It has been argued that if these fibrinous growths were indeed the products of simple deposition on the lining membrane of the valves, they would be easily separable from the subjacent tissues. That in most *recent* cases they *are* readily separable from the subjacent tissues must be admitted, and I can assert, from repeated personal observation, that in some instances, at least, of older standing, the fibrinous band which results under such circumstances can be detached without any damage to the valve beyond that of separating from it its lining membrane. And this amount of cohesion does not necessarily imply antecedent inflammation, inasmuch as fibrin deposited from the blood may obviously after a time become agglutinated to the endocardium so firmly as to cause this amount of mischief.

Ormerod, of Brighton, confirms the result of my experience at St. George's. The 265 cases were thus distributed :

117 had pneumonia alone, of whom 19 or 1 in 6·1 had pericarditis.	
86 had pleurisy alone,	„ 6 or 1 in 14·3 „
62 had pleuro-pneumonia „	8 or 1 in 7·7 „

Thus of

265 { cases of recent pulmonary } 33 or 1 in 8 { were complicated
 { inflammation } { by pericarditis.

Now, as inflammation must certainly have as great a tendency to spread from the lungs to the heart, as from the heart to the lungs, it would appear, that the inflammation of the lungs which accompanies rheumatic pericarditis, cannot be regarded as resulting from the spread of pericardiac inflammation in more than one in every eight cases, a proportion which would not interfere materially with the results from which my inferences are drawn. Even this proportion, however, is far higher than that in which there is reason to believe such a spread of inflammation does actually take place, for many of the 33 cases of pericarditis in the table were doubtless referable to the same cause which produced the pulmonary affection, and were in no degree attributable to the spread of inflammation, in consequence of the contiguity of the parts.

But the structures which constitute the valvular apparatus are sometimes firmly matted together, and such a condition undoubtedly points to some antecedent thickening process, probably of an inflammatory nature. Its existence, therefore, in the majority of these cases, is very important and suggestive. In some instances the thickening is, doubtless, referable to an attack of active lymph-effusing inflammation, and the fibrinous deposits take place on the valves partly as a result of the irritation so excited. But the valvular thickening and the deposition of fibrin are not necessarily coincident phenomena; on the contrary, there appear strong grounds for believing, that although thickening of the valves may be, and is sometimes, the result of an active lymph-effusing inflammation, occurring before or coincidently with the deposition of fibrin, yet that not unfrequently it takes place subsequently to the deposit of fibrin, and probably, in great measure, in consequence of it. In many instances in which I have had an opportunity of examining the condition of the valves shortly after the appearance of these fibrinous growths, there has been little, if any, thickening of the substance of the valve; whereas, when the examination has not taken place until these deposits have existed for some time, some thickening or matting together of the structures has been the rule rather than the exception; as if the presence of these abnormal deposits on the surface of the valve is apt to give rise to irritation and gradual thickening of the contiguous parts.

If, then, it be admitted that fibrin may be, and is, under certain circumstances, deposited from the blood without the coexistence of endocarditis, it is obvious, that if we would preserve the heart from mischief, it is necessary not only to take precautions against inflammation, but to maintain, at all hazards, the solubility of the fibrin. For both these

purposes, alkalies and the neutral salts, if freely administered, prove most efficient agents. By counteracting or destroying the irritant property of the *materies morbi*, and by promoting its elimination, they tend to prevent articular and other local inflammations; they thus prevent any further augmentation in the quantity of fibrin;¹ and by increasing as they do the solubility of that material, they prove excellent preservatives against its deposition on the valves.

My views, then, in regard to the occurrence of rheumatic *inflammation* of the heart, may be briefly stated thus:—Its frequency is probably referable to the similarity in structure between the joints and the investing and lining membranes of the heart, the rheumatic poison having a special affinity for the fibrous and fibro-serous textures throughout the body, and fixing more particularly upon those which are in any way subjected to irritation.² The occurrence of carditis, in any particular instance, is determined, in great measure, by the irritability of the heart, from whatever cause arising; but according to the intensity of the febrile disturbance, so

¹ The experiments of Messrs. Andral and Gavarret have proved that the increase of fibrin in the blood of rheumatic patients is commensurate with the extent and intensity of the local inflammations, and that the quantity of fibrin returns to its normal standard soon after the local inflammations have been subdued.

² “In the heart, as in the large articular structures, the fibre which rheumatic inflammation most affects, is always in a relation of compulsory movement with the muscle of which it forms a part. By systole of the ventricle it suffers continual attrition in the pericardium, and in the cardiac valves maintains its office by strain, and with a pull. On the other hand, the dura mater and periosteum, which no muscular action is able to displace, are (in great measure) exempted from the local inflammation of rheumatic fever.” (Dr. Wilson ‘On the true Character of Acute Rheumatism,’ ‘Lancet’ for 1844, vol. ii, p. 217.)

cæteris paribus is the liability to inflammation, whether of the joints, the heart, or any other part of the body, inasmuch as the violence of the febrile symptoms forms a tolerably accurate measure of the amount of the poison present in the system, and of the patient's susceptibility of its influence. The number and intensity of the articular inflammations, and the proneness they exhibit to shift their quarters, serve also as guides to the probability of heart or other internal affections, not only as indicating the presence of a large amount of morbid matter, and a peculiar susceptibility of its irritation, but as showing that it has no special tendency to become fixed to any particular spot, and may, therefore, seize upon the heart, or some other internal organ for which it has more or less affinity. Lastly, the extreme liability to cardiac inflammation, engendered by the repression or rapid subsidence of the articular inflammation, is explicable by the greater quantity of the poison which is thus suddenly thrown into the blood's current.

Respecting fibrinous deposition on the valves, the following is the view I have been led to adopt:—it is due to the presence of an unusual quantity of fibrin in the blood, and to the weak state of solution in which it is held, probably in consequence of the extreme acidity of the system and the absence of a due quantity of ammonia in the blood:¹ it is essentially independent of valvular inflammation, and may or may not occur coincidently with it: the probability of its occurrence, however, is greatly increased by the existence of active valvular inflammation, inasmuch as the slightest roughness or unevenness on a valve, such as would be likely to arise from inflammation, would form a nucleus for a deposit of fibrin, and would thereby favour the

¹ See Dr. Richardson's 'Astley Cooper Prize Essay' for 1856.

tendency to its deposition. Moreover its occurrence must be rendered probable by the existence of active articular inflammation, inasmuch as such inflammation not only produces a vast augmentation in the quantity of fibrin, but implies an extremely acid state of the system in which the fibrin is held in very weak solution. It takes place on the valves in preference to other parts of the heart, partly in consequence of the extreme susceptibility to the irritation of the rheumatic poison exhibited by the fibrous tissue, which enters into their composition; partly in consequence of the excited state in which they are kept by their unusually frequent and forcible contact with each other, and by the passage over them and impulse against them of blood which has become abnormally irritating in its character; partly, and also, in consequence of the strong tendency which exists to the deposition of fibrin on anything projecting into the arterial current.¹ A further consideration of the circumstances under which these accretions take place, serves also to explain why the angular projections and the edges of contact of the valves are frequently loaded with fibrinous deposits, whilst the surface and free edges of the valves, and other parts of the endocardial membrane, retain their healthy, unencumbered condition. For nothing can be more certain, than that fibrinous deposition may be determined to a spot by any cause calculated to roughen or irritate the endocardial membrane; and the angular projections and the edges of contact of the valves, are just the parts which are most subjected to tension, attrition, and pressure.

¹ See report of Mr. Simon's experiments in his 'Lectures on General Pathology.'

CHAPTER VII.

ON RHEUMATIC INFLAMMATION OF THE HEART.

IN the preceding Chapter I have endeavoured to trace the predisposing cause of rheumatic carditis : in the present, I propose to commence by a description of the organic changes to which it gives rise, and afterwards to proceed to the exposition of its physical signs and general symptoms. By following this course, the latter will be more readily understood and appreciated, as they will thus be recognised as the natural results of the local changes induced in the heart and its membranes, and of the altered mechanism consequent thereupon.

It has been already stated, that when in the course of acute rheumatism the heart becomes the seat of inflammatory action, its investing and lining membranes, the pericardium and the endocardium, are both apt to be implicated in the mischief which takes place. Pericarditis, however, is occasionally met with, uncomplicated by any other affection of the heart ; and endocarditis, in like manner, may run its course without the concurrence of inflammation of the pericardium. Under these different circumstances lesions are produced, which differ widely in their seat and character, and I will therefore first describe the changes produced by an attack of pericarditis, and then proceed to those resulting from an invasion of endocarditis.

It will be necessary, however, to a full understanding of the subject, to take into consideration the nature of the membrane inflamed, and the circumstances under which the inflammation takes place.

The pericardium is a serous membrane, and partakes of the characters which belong especially to that class of tissues. Its inflammation, therefore, is of the adhesive kind, and is accompanied by an effusion of serum or of plastic lymph, or of both these products in varying proportions; or sometimes, more especially in unhealthy subjects,¹ by a serous effusion more or less tinged with blood, and mixed with curdy, ill-concocted lymph, having a tendency to assume a puriform character. But the pericardium is not only a serous membrane, it is also a shut sac, the two opposed surfaces of which are in contact with each other, and kept in constant motion, the one on the other, by the natural action of the heart. Hence, although when it becomes inflamed, the inflammation may be sometimes controlled by judicious treatment, before it has involved the whole extent of the membrane, yet more generally the constant attrition of the two inflamed surfaces keeps up and aggravates the original mischief, until it has spread over the entire surface of the heart.

The effects which follow an attack of pericarditis vary according to the extent of the disease and the character of its products in each particular instance. When the membrane has been only partially implicated, lymph may be

¹ I say "in unhealthy subjects," because these differences in the products of the same disease are due here, as elsewhere, to differences of constitution, and to circumstances tending to influence the patient's strength; and the changes which subsequently take place in the morbid products, are also governed by such peculiarities.

poured out in quantity insufficient to cause adhesion between the two layers of membrane, and then by degrees it may be gradually reabsorbed until a white patch on the heart only remains where a thick coating of lymph had previously existed; or it may be effused in larger quantities, and the inflamed surfaces may be glued together at the seat of inflammation; or serum mixed with only a small quantity of lymph may be effused, distending the sac of the pericardium, and keeping its two surfaces more or less asunder, in which case adhesions take place less readily, and those which do occur are partial and irregular. When the entire membrane becomes inflamed, the changes produced are proportionably extensive. If the effusion consist chiefly of coagulable lymph, the two surfaces may become agglutinated together throughout their whole extent; if it consist of lymph and serum, the liquid part may be gradually absorbed, and universal adhesion may take place as before; whilst if it consist chiefly of serum mixed with pus, or with shreds of curdy lymph of low vitality, or if the serum be very copious and be not readily absorbed, adhesion sometimes fails to take place, the sac of the pericardium becomes permanently distended, and the heart's action greatly embarrassed. The former results are met with in the vigorous and healthy; the latter are observed chiefly in the scrofulous, weakly, or unhealthy. In the first class of cases, if the patient survive the first shock of the attack, he may at first experience little ill effects from the lesion his heart has sustained. Indeed, according to my experience, such is generally the case when adhesion occurs between those parts of the pericardium which are naturally in apposition; and even when parts not naturally in apposition have become adherent, a temporary and partial recovery may ensue, and the sufferer, though tormented by

palpitation and dyspnœa on exertion, may yet survive his attack for a period varying from a few months, to twelve months, or even to several years. But in the second class of cases there is no effort at recovery, and the unhappy patient lingers on a victim to palpitation and frightful paroxysms of dyspnœa and suffocation, until after the lapse of a short time—sometimes in the course of a few days—his life and his sufferings are terminated rather suddenly by death.

It has been suggested that the lymph effused in pericarditis is often thoroughly reabsorbed, so that the pericardium is restored to the condition of health, and perfect recovery takes place. This I do not believe to be the case. Doubtless it may be reabsorbed to a very great extent, so that a thin layer only may remain where a copious and thick deposit had previously existed, but I quite agree with Dr. Latham and Dr. Watson that adhesion, more or less general, between the two layers of the pericardium, is the most favorable issue we are justified in expecting, when inflammation has been *extensively* diffused over the membrane. For although we see and know that the lymph poured out in iritis disappears, and are bound to admit that there is no, *à priori*, impossibility in the reabsorption of the lymph effused in pericarditis, still the improbability is so great as to amount almost to an impossibility. In iritis, the inflamed parts may be kept tolerably at rest, and the inflammation speedily subdued, and as the quantity of lymph exuded is comparatively small, its absorption may be effected under the influence of mercury before it has time to become organized. But in pericarditis the constant attrition of the two inflamed surfaces keeps up and aggravates the existing inflammation, so that it endures for a lengthened period; the lymph is usually poured out in very

large quantities, and in healthy persons, when its vitality is great, shows a strong disposition to become organized, and as the two surfaces of membrane, each loaded with a layer of this plastic medium, are constantly in apposition, it is difficult to conceive how they can fail to become adherent. But our post-mortem records show clearly and indisputably that a small and partial effusion of lymph may sometimes accompany pericarditis, and that not unfrequently the lymph is curdy and but slightly plastic. In both these cases adhesions may fail to take place. In the first, because the lymph, even if plastic, is not in quantity sufficient to restrain the to and fro motion of the two surfaces of the membrane. In the last, because it is from its nature but little disposed to form adhesions, and, moreover, is almost invariably accompanied by a copious effusion of serum, which keeps the two surfaces of the pericardium asunder, until by continued washing it is rendered shreddy, and, for the most part, inapt for the purpose of adhesion. In such cases, doubtless, absorption of the lymph is gradually effected to a very great degree, and some loose membranous bands, or a few white patches only are left, such as have been well described by Mr. Paget, in volume XXIII of the 'Medico-Chirurgical Transactions.' But in ordinary cases, when *extensive* pericarditis occurs in healthy persons, a large quantity of highly plastic lymph is poured out, and then so rapidly does adhesion take place and organization of the plastic medium commence, that I look upon its *complete* absorption as next to impossible.

Thus, then, to speak in general terms, the primary effects produced by extensive inflammation of the investing membrane of the heart, are first, effusion either of lymph or serum, or of serum mixed with coagulable lymph, or with curdy, ill-concocted lymph, or with more or less blood or

pus : and then either absorption of the liquid, and adhesion of the pericardium to the heart over a greater or less extent, or else a still further continuance of effusion, and death as its natural consequence.

It must not be imagined, however, that death occurs only in cases accompanied by an abundant liquid effusion, for although these are generally the most unfavorable instances, yet fatal results are sometimes met with even when little else than lymph has been poured out. Nor does the fatal issue occur at any particular period of the attack ; rarely, indeed, does it take place at a very early date, but it sometimes happens before, sometimes not until after, adhesion has taken place. Thus the morbid appearances observed on dissection vary both with the character of the inflammation and with the period at which the attack has proved fatal. If death has occurred early, traces of inflammation may be often observed even before cutting into the bag of the pericardium. Lymph and serum, and sometimes pus, may be found effused into the anterior mediastinum, while the pericardium itself is distended with fluid, or if not much distended, is soft and pulpy to the touch. And no sooner is its cavity laid open than the reason of this abnormal condition is apparent. In the former cases it will be found to contain an enormous collection of serum, sometimes clear, more often turbid, generally containing flakes of lymph, not unfrequently tinged with blood ; and when this is allowed to escape, the surface of the membrane will be seen highly vascular, and covered, over a greater or less extent, by a coating of recent coagulable lymph. In the latter cases a small quantity only of liquid effusion will be found, but a large amount of plastic lymph often tinged or mottled with blood will be seen deposited in successive layers on the internal surface of the sac. And a very pecu-

liar appearance this lymph presents. The constant motion and attrition of the parts prevent its forming a smooth surface, and its appearance varies according to the amount of serum present and to the vitality of the more solid exudation. If it be of low vitality, it adheres very loosely to the membrane which exudes it; much of it is detached by the motion of the heart, and floats in loose shreds in the surrounding serum, while that which still remains adherent to the membrane is rough, loose, and shaggy. If it be more highly organizable, and serum be present in sufficient quantity to keep the two sides of the sac asunder, and thus prevent their immediate adhesion, then it is thrown, by the action of the heart, into rough and irregular transverse ridges. If, on the other hand, there be little serum present, and the membrane be covered with a thick coating of highly plastic lymph, then is the tendency to adhesion great, very slight lateral motion of the membrane can take place, and a spongy, or honey-comb, or tripe-like appearance, is produced by the repeated contact and separation of the two inflamed surfaces.

These are the appearances observed when the patient falls an early victim to the attack: but when he dies, as he sometimes does, at a later stage of the complaint, soon after the pericardium has become adherent to the heart, there are other points worthy of observation. The medium of adhesion will be found to consist of plastic lymph, still soft and easily broken down; and which, on more than one occasion, I have known to give way during life on the speedy recurrence of pericardial inflammation. But in this lymph may be seen here and there some bloody spots or streaks, or anastomosing red lines, the first indications of its commencing organization.

And if a still longer period elapses before death, the

organization of the plastic lymph will be found completed, and the pericardium will be seen either firmly and uniformly glued to the heart, or attached to it by bands, or a network of fine adhesions having a smooth glistening surface, and presenting the characters of serous membrane.

Such are the effects, such the changes produced by inflammation of the investing membrane of the heart, and inflammation of its internal or lining membrane gives rise to lesions equally striking and disastrous. The natural transparency of the membrane may be replaced by whiteness and opacity, fibrin may be deposited upon it, forming beaded or wart-like fleshy excrescences, and lymph may be effused either beneath or on its surface, giving rise to thickening, rigidity, and puckering. In some cases I have known ulceration ensue, which has not only produced a perforated condition of the valves, or a broken down, ragged state of their edges, but in one or two instances, has spread to the chordæ tendineæ, which have been thus eaten through and rendered useless. Some cases too are on record, though I have never met with one, in which suppuration of the muscular substance of the heart has taken place, and has caused perforation of the septum ventriculorum.¹ Happily, however, phenomena such as these are seldom the result of rheumatic inflammation; and when they *do* occur, they may be regarded as the offspring of a peculiarly unhealthy constitution.

It sometimes happens that inflammatory products are found in the different chambers of the heart, more especially in the left auricle; but in most instances they are

¹ For cases in illustration of this fact, see Dr. Watson's 'Practice of Physic,' ed. 1, vol. ii, p. 287, and a Report by Mr. Avery, in the 2d volume of the 'Trans. of the Pathological Society of London.'

confined to the valvular apparatus or its immediate neighbourhood, and the mitral and aortic valves, the valves which have most fibrous tissue in their composition, and which are constantly bathed in highly-fibrinized arterial blood, are those which appear peculiarly liable to suffer. The right cavities, however, with their tricuspid and pulmonary semilunar valves, are sometimes, though rarely, affected.¹

The fibrinous vegetations which constitute the most frequent form of rheumatic valvular lesions, vary greatly in their appearance in different cases and at different stages of their existence. They are often very numerous, and vary in size from a pin's head to a millet seed. They are at one time isolated and distinct from each other, at another partially confluent; and when several spring from a common base, they may form a mass of considerable size. Sometimes, when their growth has been rapid, or, to speak more correctly, when fibrinous accretion has taken place rapidly, as it does under certain conditions of constitution, their form is changed, and the action, which in other states of the system might have resulted in the deposition of small warty granules along the edges of contact of the valves, gives rise to the production of long filamentous growths, or of large pedicled masses forming pendulous tumours, which hang loosely into the ventricle, and are moved to and fro by the current of the blood.² When the vegetations assume the former character, they are usually

¹ For cases in point, see the fifth volume of the 'Edinburgh Medical and Surgical Journal,' and the particulars of a case recorded by my colleague, Dr. Wilson, in the 'Lancet' for 1844, vol. ii, p. 217.

² Some of these masses, measuring from half an inch to an inch in length, are preserved in the museum of St. George's Hospital.

confined to the valves, and chiefly affect their edges of contact, so that in the sigmoid valves they are arranged in a double crescentic form;¹ but when their growth is more luxuriant, as in the instances last alluded to, they are more widely distributed over the endocardial membrane. The surface of the valves, against which the current of the blood is directed, is often thickly studded with them; on the edges of contact of the valves, they form festoons or fringes; the chordæ tendineæ attached to the mitral valve are sometimes loaded with an abundant crop of them; and occasionally in the different chambers of the heart, more especially in the left auricle, they are scattered profusely over the entire surface of the lining membrane. Judging from my own experience, the cases in which these last forms of vegetation occur, are just those in which, either from some constitutional peculiarity, or from some other cause equally beyond our ken, these accretions manifest a strong tendency to decay, and in which arise those formidable erosions and ulcerations, already mentioned as sometimes accompanying rheumatic endocarditis.²

The microscopic examination of these fibrinous deposits establishes the identity in nature of their different forms, and shows that they are sometimes granular, but more generally imperfectly fibrous in texture, presenting somewhat of a laminated appearance; and that throughout their

¹ Dr. Watson's 'Lectures,' ed. 1, vol. ii, p. 267.

² "In a patient of Dr. Hawkins's, I saw a cylindrical excrescence of this kind, which measured an inch in length. The valves presented *slit-like perforations*, and from the edge of one of these slits in the mitral valve, this long vegetation dangled into the ventricle. The whole of the valves of the aorta were covered on their ventricular surface with similar, but shorter excrescences." (Dr. Watson's 'Lectures,' ed. 1, vol. ii, p. 253.)

structure are numerous granules and granular masses, and oil-globules in varying proportions. In some instances of old-standing rheumatic endocarditis, I have seen cartilaginous and calcareous deposits on the valves and in the fibrinous deposits; but this, doubtless, has resulted from earthy or atheromatous degeneration which has taken place subsequently to the attack, in which the valves were injured or the fibrin first deposited.

In colour and consistency these accretions vary just as much as in size and in position. They are sometimes grey and friable, sometimes of a pink or reddish colour, soft, and easily broken down, and can be readily detached from the smooth surface of the membrane on which they are deposited; at others, they are less coloured, and of a much firmer consistence, but still admit of being separated from the membrane; whilst, in another class of cases, or rather at a more advanced period of the disease, they become perfectly colourless, and so firmly adherent, that they can be removed only by tearing the membrane to which they are attached. At a still later period, these warty growths or bead-like accretions cease, in most cases, to exist as such upon the valves; they become by degrees more firmly agglutinated to the endocardial membrane, and incorporated with the structure of the valve; and merging gradually into one another, until the divisions between the several granules are effaced, they are ultimately replaced by a laminated ridge of fibrin. This is marked at first by serratures corresponding to the divisions between the original granules, but after a time it also loses all traces of its origin or mode of formation, and becomes smooth and polished like the rest of the endocardium.

Such are the changes which ensue when there is a tendency to the repair of these valvular lesions; but when,

as is frequently the case, there exists a tendency to further disorganization, the changes which occur are of a different character. The fibrinous deposits appear to excite unusual irritation, and to give rise to thickening of the valves, with gradually induced rigidity, corrugation, and contraction; the motion of the valves becomes more and more limited, and adhesion of their flaps sometimes ensues; or, perhaps, earthy or atheromatous degeneration takes place, and the valvular apparatus, strained by the unwonted force and frequency of the heart's action, and rendered weak and brittle by the changes it has undergone, is no longer able to offer resistance, and is lacerated or slit up.

These changes on the internal surface of the heart, resulting from acute rheumatic inflammation, are far more serious than those produced by inflammation of its external surface. If, in the first fury of its attack, pericarditis be as important and dangerous as endocarditis, it certainly is less so in the lesions it leaves behind it, and in the consequences to which it ultimately gives rise. It has been stated that when the former disease is extensively diffused, effusion of lymph and serum takes place which gives rise to adhesions, more or less general, between the visceral and parietal layers of the pericardium. The investing membrane becomes either partially or wholly glued to the heart by the interposed lymph, or loosely attached to it at one or more spots by a single band or a network of adhesions. The slightest adhesions must certainly embarrass the heart's action to a greater or less extent, yet when they are partial only, and take place between such parts of the pericardium as are naturally in apposition, or when, on the other hand, they are universal, they derange the heart's action far less than might be expected. I have repeatedly, on dissection, seen old lesions such as these in persons who for years

before their death had been in excellent health, and during life had exhibited no symptoms of diseased heart. But when the adhesions are formed between those portions of the pericardial sac which are not naturally in apposition, then, unless they be very loose, they cause a drag upon the heart, and restrain the freedom of its action to a much greater degree;¹ palpitation and dyspnœa ensue, and the organ struggling to overcome the resistance, becomes gradually more and more dilated and hypertrophied, until, when it is unable any longer to fulfil its functions, the blood begins to be arrested in its passage through the lungs, and cough and dyspnœa and palpitation result. Then follows the terrible array of symptoms connected with an impeded pulmonary circulation:—A loading of the capillaries with dark coloured, imperfectly aerated blood, coldness and lividity of the extremities, blueness of the lips and face, congestion of the liver and other internal organs, and, as the natural consequence, dropsical effusion into the cavities of the chest, into the abdomen, and into the cellular tissue of the body. Nor do these fearful changes occur without producing a proportionate amount of suffering. Excessive palpitation, with præcordial pain and anguish;—paroxysms of dyspnœa threatening suffocation, orthopnœa, constant restlessness, and impossibility of sleep;—these are among the inevitable consequences of such an embarrassed state of the vascular and respiratory systems, and are the symptoms

¹ Louis has recorded an instructive case in point. A single adhesion had taken place between the parietal pericardium, and that portion of the visceral pericardium which invests the right ventricle. The result was, that the patient was unable to lie on his back, inasmuch as, whenever he assumed that position, the heart at each systole dragged upon the band which held it back, and thereby caused excessive pain and smarting.

immediately preceding death. Cases, however, in which symptoms such as these are dependent solely on exocardial mischief, are of rare occurrence, inasmuch as extensive rheumatic pericarditis seldom runs its course without concurrent endocardial inflammation, and even when it does so, rarely produces much hypertrophy of the heart, or gives rise to any marked symptoms of cardiac affection, unless, as already stated, the adhesions which result, whether partial or universal, are formed between those parts of the membrane which are not naturally in apposition. Such at least is the result of my experience; the only exception being in the case of patients who, from their position in life, have been forced to pursue some laborious occupation.¹

But when inflammation of the endocardium has occurred, and any permanent traces of its ravages have been left behind, hypertrophy and dilatation are almost certain to be produced before any lengthened period has elapsed. In this case the chief effects of the inflammation are displayed on the valvular apparatus of the heart; and so delicate and

¹ I am acquainted with a gentleman, at the present time, who had a severe attack of pericarditis, at the age of ten, followed without doubt by very general adhesion of the pericardium. He is now twenty-nine years of age, and has never yet experienced the slightest heart symptoms. As a boy, he took violent and protracted exercise in running, and his heart soon became somewhat hypertrophied and dilated, though not so as to cause him any uneasiness; but from the age of eighteen he has lived a quiet life, and I cannot perceive any alteration in the condition of the heart since that time. Nor do I believe this to be a singular instance. Dr. Wm. Budd, who has had much experience in these matters, reports that he has "seen a great number of cases of adhesion of the pericardium (often general) of long standing, in which the heart was in all other respects natural, and its functions during life (almost?) perfectly performed." ('Library of Medicine,' vol. v, p. 195.)

so nicely adjusted is this apparatus, that any damage it sustains, however slight, must necessarily interfere with the due maintenance of the circulation. If the valves be not actually broken down by ulceration, or loaded with fringes of fibrinous deposits, they will probably be rendered thicker and more rigid than natural, or will bear on their angles small bead-like or granular accretions. In order to overcome the obstacle thus presented to the circulation, the heart will have to contract more forcibly than natural. Thus, if the obstruction be permanent, and the increased labour of the heart continue, hypertrophy of its walls and dilatation of its cavities will be produced, and then, as in the former case, the disease will prove fatal, with palpitation, dyspnœa, and dropsy. Of course, the rapidity with which the disease runs its course, will depend, in some measure, upon the irritability of the heart, the state of the lungs, the habits of the patient, and other collateral circumstances, but *cæteris paribus*, it will bear a tolerably constant relation to the amount and nature of the valvular disease. The more serious the mischief, the greater the obstruction to the blood's current, the quicker will hypertrophy and dilatation result, and the sooner will the effects of these lesions be perceived.

I have hinted that the mischief produced by endocarditis may not be of such a nature as permanently to affect the action of the heart, and there is, I think, presumptive evidence to show that some thickening of, or deposit on the valves may take place, and may be entirely got rid of by absorption. Thus, seeing how readily such lesions are repaired in other parts of the body, there can be little doubt but that when the results of endocarditis are confined to redness and œdematous swelling, the mischief may subside,

and altogether disappear, with the gradual cessation of inflammatory action. Even when lymph has been poured out on the surface or in the substance of the valves, there is reason to believe that it may be gradually reabsorbed, and the damage completely repaired. In most cases, however, we should not be justified in anticipating such a happy result: experience has shown, that not unfrequently the process of repair is imperfectly effected, the valves remaining thicker and more rigid than natural. And when, as sometimes happens, the valves are coated with plastic lymph, and become more or less agglutinated together, or one of them, perhaps, is folded on itself, and its apex glued either to the adjoining surface of the aorta or to some other portion of its own area, then the damage which has been sustained is irreparable, and the disease must tend rapidly to a fatal termination.

But there is another class of cases, in which the question of the possibility and probability of repair does not admit of such a certain answer. I allude to those cases in which fibrinous deposits more or less extensive take place upon the valvular apparatus. In extreme instances, doubtless, repair is impossible; but presumption favours the belief, that in ordinary cases it is often effected more or less perfectly. The absorption of the lymph effused in pericarditis affords a proof that the processes essential to repair may take place in the heart as in other organs, and the results observed to follow inflammation of other fibrous tissues are conclusive as to there being nothing in the structure of the parts to prevent fibrinous accretions on the valvular apparatus, and the thickening to which they give rise, from being in like manner got rid of, and the parts restored to their former healthy condition. Nay,

more than this: dissection has shown that the process of reparation does sometimes advance to a considerable extent;¹ and observation has proved, that functional if not organic repair may, in some instances, be completed.² But, practically, I fear the cases are few in which this process can be efficiently carried out. When *complete* reparation is effected in other fibrous structures, it is mainly attributable to the perfect rest at which the parts are kept, and to the mechanical and other local applications we are enabled to make use of; and, even in pericarditis, the injured parts are kept comparatively quiet, by the adhesion of the two opposed layers of the inflamed membrane; the irritated surface of the membrane can be no longer subjected to attrition; no more lymph or serum can be poured out, and that which has been already effused may, to a great extent, be got rid of by absorption. But the mischief about the valves takes place under different circumstances, and is altogether of a different nature. The fibrinous vegetations which are frequent concomitants of rheumatic endocarditis, and are the lesions from which injury most frequently results, are not the products of inflammatory exudation, but are deposited from the blood, and may and do occur not only during active inflammation, but during a state of mere irritation.³ Hence, as the constant motion of the valves must tend to keep up such a condition, and as the irritability must be further excited by the existence of these adventitious deposits, I fear

¹ *Antea*, p. 173.

² For some excellent remarks on this subject, see Dr. Ormerod's 'Gulstonian Lectures.'

³ This was beautifully exemplified in the course of Dr. Hope's experiments on the ass. As the circulation became sluggish, a deposition of fibrin forming a fleshy vegetation took place at the spot where the heart's valves had been irritated.

there is little chance of recovery when obstruction to the circulation is dependent upon this form of lesion. Accurate observation, however, and sound deduction, point out the possibility of such a favorable issue, though experience scarcely holds out any prospect of its occurrence. On three several occasions I have had reason to believe that their removal has been effected partially if not wholly. In the instances alluded to, the accession of heart disease was marked by all the general and physical signs of endocarditis, and the valvular murmur was most intense. Nevertheless, on the rapid subsidence of inflammation, the bellows-murmur gradually ceased. In two of these cases the sound commenced so suddenly, increased so rapidly, and was accompanied by such well-marked general and local symptoms of carditis, that there could be no more doubt as to the occurrence of inflammation, and of some deposit or thickening as the result of that inflammation, than would attach to any fact announced through the stethoscope, but not submitted to ocular demonstration. Doubtless the murmur in each of these instances is explicable, on the supposition that the valves were merely inflamed and swollen, or that lymph had been effused on their surface; but so constantly are fibrinous deposits associated with rheumatic endocardial inflammation, that the existence of such deposits in the cases alluded to is rendered extremely probable.¹

¹ Three other sources of this adventitious valvular sound might be suggested:—1stly, the anæmic condition of the patient; 2dly, the increased force of the heart's action, combined with some disproportion between the size of its cavities and the orifices of the aorta or pulmonary artery; 3dly, the irregular contraction of the structures connected with the valvular apparatus, consequent on the morbidly exciting condition of the blood. Neither of these explanations, however, seems applicable to the murmur, in the cases in question. For, in the first place, the patients had not been sub-

Without pausing to enter more fully into details respecting the changes induced by endocarditis, I will at once pass on to the next part of the subject, and will endeavour to point out the natural connection subsisting between the structural alterations caused by exocardial and endocardial inflammation, and the various physical signs by which, during life, we are able to detect their existence, and to trace the various steps in their progress. Here, again, to facilitate explanation, I will first suppose inflammation of the investing membrane of the heart to take place, without the concurrence of endocardial mischief, and will then trace the course of an attack of endocarditis occurring independently of pericardial inflammation.

Before this, however, let us briefly consider the condition of the parts in a state of health. Closely applied to and investing the heart is a membrane, which, on reaching the root of the large vessels, is reflected on itself and forms a close sac. This sac is termed the pericardium. On its internal surface it is lined by a smooth and glistening serous membrane, the two layers of which, in their natural state, glide smoothly and noiselessly over each other, at each successive systole and diastole of the heart. But, in disease,

jected to depletion, neither were they anæmic, nor was the sound heard in the course of the large vessels, as on such a supposition it ought to have been; 2dly, there was no evidence of any disproportion between the size of the ventricles and the orifices of the great vessels, and even if there had been, a murmur consequent thereon should have arisen at an earlier period of the attack, when the heart was acting quite as rapidly and forcibly; and 3dly, had it been due to *irregular* contraction of the structures connected with the valves, and not to organic mischief occurring in the valves themselves, it should have evinced some irregularity, both as to its character and continuance, whereas it remained constant, and of the same character throughout, though increasing steadily in intensity.

the condition of the parts is changed, and their mechanism altered. As soon as the sac becomes inflamed, and pericarditis, as it is termed, sets in, the smooth and glistening membrane becomes dry, and, after a time, covered by a rough irregular coating of effused lymph, its lubricity is consequently destroyed, and its motion, which before was noiseless, is accompanied by the sound of friction, occasioned by the attrition of the two opposed and dry or roughened surfaces. And a very peculiar sound this rubbing sound is. Sometimes it is rough, harsh, and rasping; sometimes it more nearly resembles the creaking of leather, as it is heard in a new saddle in riding; but whatever its tone or musical variety, it has the peculiarity of being almost invariably a to and fro sound, accompanying the whole of the heart's action, and superadded to its natural sound.¹ From the position of the parts in which it takes its origin, this sound is superficial, and seems near to the ear, and this, among other things, serves to distinguish it from the double bellows-murmur, which is pathognomonic of valvular disease. Another peculiarity attaches to this sound. Unlike the double murmur of valvular disease, which generally arises from permanent mischief, and is therefore necessarily persistent, the to and fro sound of pericardial friction results from causes of a transient nature, and endures, therefore, only for a limited period. It arises, as already shown,

¹ This peculiarity of the sound attendant upon pericardial inflammation was first, I believe, pointed out by Dr. Watson, and about the same time, by Dr. Stokes, of Dublin. To these eminent physicians the profession is indebted for the separation or analysis of the abnormal sounds, arising in the course of cardiac inflammation: in other words, for distinguishing between the friction-sound and the bellows-murmur, and for showing that the former results from exocardial inflammation, the latter from causes connected with the internal surface of the heart.

from the rubbing of the two roughened layers of the pericardium, and anything which prevents this rubbing, must necessarily put a stop to the friction-sound also. Hence, it may cease from one of two causes; either from adhesion of the two layers of the membrane by means of interposed lymph, or from their total separation by the effusion of a large quantity of serum. In the former case, the cause of its cessation is a permanent one; consequently, when adhesion is firm and universal, the friction-sound can never recur; in the latter, its cessation is due to temporary causes only, and when the serum is reabsorbed, and the inflamed and roughened surfaces come again into apposition, the sound of attrition will probably reappear, to cease only when permanent adhesion has taken place. So that in watching a case of pericarditis, we must not be misled by the subsidence of the friction-sound. If we have once satisfied ourselves as to its existence, we must endeavour to ascertain whether its disappearance be due to excessive effusion, or to adhesion of the two layers of the membrane; as if due to the former cause, it would be a fatal mistake to slacken in our efforts to arrest the disease, under the idea that adhesion had taken place, and that the disease was progressing to a favorable termination. Fortunately, therefore, the effusion to which I have alluded gives abundant physical signs of its existence.

The first and natural effect of its occurrence, is the production of a dull sound on percussion in the præcordial region. In the normal condition the præcordial dulness is seldom above an inch and a half or two square inches in extent, as the lung laps over the remainder of the heart, and yields a clear sound on percussion. But when effusion takes place into the pericardial sac, the space occupied by the heart and its envelope increases, the lungs are pushed

aside, and the chest is found to yield a dull sound on percussion, where it had previously furnished a well-marked resonance. Sometimes this dulness is found as high as the second or even the first left rib ; sometimes it extends beneath the whole length of the sternum, except about an inch and a half at the top ; not unfrequently it reaches over to the right side of the sternum, and occasionally I have known it extend over almost the whole of the anterior surface of the chest. Sometimes, indeed, increased præcordial dulness may be occasioned by old standing enlargement of the heart ; but in a previously healthy person it is symptomatic of effusion, and affords a tolerably accurate measure of its amount. Its absence, however, must not be regarded as certainly indicative of the absence of effusion, as the dulness which otherwise would have resulted from the presence of effusion, may be masked by the intervention of a portion of emphysematous lung. In such a case the chest would yield unusual resonance.

Thus, then, if the cessation of the friction-sound be dependent on distension of the pericardial sac, percussion will readily indicate the fact ; and in proportion as the effusion increases in quantity, so will the limits of the dulness be extended, and so also will the heart's action become more and more embarrassed, its impulse more feeble and irregular, and its sounds more distant and less audible. This, I need hardly say, is just the reverse of what happens when the friction-sound ceases in consequence of adhesion of the two layers of membrane, for as absorption progresses, and adhesion takes place, the præcordial dulness decreases in extent, the heart's impulse becomes steadier, its sounds louder and clearer, and the pulse firmer and more regular.

It may sometimes happen, that we miss listening to the

heart until so much fluid has been effused into the pericardium that a friction-sound is no longer audible. In hospital practice patients often are not seen until after the stage of attrition has passed away; and even in private practice cases sometimes occur, in which, either from the rapidity with which effusion has taken place, or from the absence of pain and other general symptoms of cardiac distress, the stage of attrition is entirely overlooked. In some such instances an inclination of the body forwards, or firm pressure exerted over the region of the heart, serves to bring the two layers of the pericardium into apposition, and thus enables us to detect exocardial friction. But it sometimes happens that even these measures are ineffectual, and then percussion is peculiarly valuable; it affords information not otherwise attainable. I have known præcordial dulness, for days, the only physical sign of the mischief which had occurred, and taken conjointly with the distance, feebleness, and irregularity of the heart's sounds, it has enabled me to trace accurately the extent to which effusion had proceeded.

There is one other physical sign by which the existence of pericarditis is sometimes marked. I mean a peculiar fremissement or thrill communicated to the chest, and from the chest to the hand, when placed on the situation of the heart. This strange sensation is most perceptible between the cartilages of the second and third, and the third and fourth ribs on the left side of the chest. Like the friction-sound, it results from a vibration occasioned by the attrition of the two roughened surfaces of the pericardium, and hence it imparts to the touch the same information which is conveyed by the friction-sound to the ear. Its appearance and its disappearance are also regulated by the same circumstances on which the commencement and the cessation of

the friction-sound depend, but unlike the friction-sound, it is by no means always, or, indeed, generally present. In every case accompanied by this thrill, in which I have had an opportunity of examining the conditions of the parts after death, the outer layer of the pericardium has been found glued, as it were, to the parietes of the chest by lymph effused into the anterior mediastinum; and if, as I believe, this consolidation of the parts, and the consequent formation of a good conducting medium, be essential in pericarditis to the production of this tremor, then is the infrequency of its occurrence at once explained; as is also the fact, that it usually accompanies the whole of the heart's action, whereas the purring tremor, communicated to the chest by extensive disease of the valvular apparatus, is usually felt only with the systole of the heart, when that organ is brought into contact with the anterior parietes of the chest. I do not recollect having ever met with this observation in books, but I have already verified it in five instances, and am satisfied of its correctness.

Accompanying this thrill, in certain cases, is an undulatory movement visible on the chest, in the same position where the friction-thrill is felt, viz., between the cartilages of the second and third, and the third and fourth left ribs. Whenever the eye detects this motion, it is almost certain that the friction-thrill will be sensible to the touch; but it by no means follows, that when friction can be felt, this undulatory movement will be perceptible on the chest. This, I believe, is attributable solely to the difference in the amount and character of the effusion. For as the undulation is a motion communicated to the parietes of the chest, by the movement of fluid in the pericardial sac, it obviously will not, and indeed cannot, be present, when the products of inflammation are chiefly solid. The value of these signs,

however, both of friction and of undulation, is greatly diminished by the fact, that they do not occur until an advanced period of the attack, when the real character of the disease can hardly be mistaken.

Thus, then, the first and the only pathognomonic sign of pericarditis, is the peculiar sound of friction I have endeavoured to describe; superficial in its situation; audible, perhaps, over a considerable surface of the chest, but inaudible along the aorta or large vessels; varying in its tone according to the nature and amount of the effusion, but almost always preserving its distinctive character of a to and fro sound, produced by the rubbing of two roughened surfaces upon each other. In any case in which this has once been heard, there cannot be a doubt as to the existence of pericardiac inflammation; the only question which can arise, is as to its progress and mode of termination. And here again we derive the greatest assistance from a careful study of the physical signs. If the friction-sound cease after a short existence, and coincident with its cessation we find decreasing dulness in the præcordial region, increasing steadiness in the heart's action, and clearness and loudness of its sounds, the prognosis must be favorable, inasmuch as it is evident that adhesion is taking place, and that, unless some unforeseen accident occur, the patient will go on rapidly to recovery. If the friction-sound continue for a considerable time, it is evident that no great amount of serum can be present, and that the effused lymph must be of low vitality, with but little disposition to form adhesions. Therefore, although the case may go on slowly to recovery, its termination is doubtful, and our prognosis should be given accordingly. If, again, the friction-sound disappears at an early period of the attack, and at the same time we discover increasing dulness in the cardiac region,

and find the heart's impulse becoming gradually weaker and more irregular, its sound more feeble and distant, and the pulse fluctuating or intermittent, then we are made aware that the cessation of the sound is referable to extensive effusion into the sac of the pericardium, whereby the heart is greatly embarrassed; and as this is always an unfavorable symptom, our opinion must be very guarded. But even then, if, as we watch the case from day to day, we find these symptoms again decreasing, and the friction-sound gradually returning, we may feel assured that absorption is taking place, and may venture to speak hopefully of the issue, even though the patient be much exhausted and reduced.

It must be admitted, then, that the physical signs of pericarditis are satisfactory, not only as resulting from evident mechanical causes, but as being remarkably distinctive in their character, and enabling us to detect the first commencement of disease. In some, though by no means in all, respects, the signs of endocarditis are equally satisfactory. If we know the previous condition of the heart, they enable us to discover, at an early period, the inroad of endocardial inflammation, and to point out with certainty the exact situation where mischief has occurred, and where it is still occurring. Some difficulty, however, may arise in discriminating between those murmurs which are referable to organic valvular mischief, and those which take their origin in functional disturbance; and if we are unacquainted with the previous condition of the heart, it is sometimes almost impossible to say whether a murmur results from existing endocardial inflammation, or from old-standing valvular disease. Unfortunately, too, the accuracy of the information we derive from them, affords greater evidence of our skill in diagnosis, than it does of our ability in effecting a cure. For although they often give us

correct and early intelligence of the inflammatory attack, and indicate the exact spot at which mischief is taking place, we generally prove unsuccessful in arresting its progress, until it has produced some permanent lesions. They enable us to hasten to our patient's rescue, and prevent the further inroads of disease, but they too often prove us incapable of repairing the mischief it has already occasioned.

The nature of the lesions has been already pointed out. They generally consist of greater or less derangement of the valvular apparatus; and chiefly, though not invariably, affect the valves on the left side of the heart. There may be either thickening, or puckering, or rigidity of the valves themselves, or fibrinous deposits on their edges or surface, or perforation, or tearing, or breaking down of their substance. In all these cases, the current of the blood must be more or less interfered with: in some the onward current must be obstructed; in some a reflux of blood must take place through the imperfectly closed opening; and in others, the same lesion may cause obstruction to the onward current, and also permit of regurgitation. In all, however, an eddy must be produced, together with a greater or less degree of vibration; and the result of such vibration is the production of a sound, or, as it is often called, a murmur, accompanying the rhythm of the heart. If, when there is much obstruction, the heart's cavities be enlarged, and its muscular walls strong, so that a large current of blood is driven forcibly past the obstruction, the murmur produced is more intense than it would be if the cavity of the ventricle were not dilated, and its walls not thickened¹—than

¹ Of course, if there be great hypertrophy, the thickness of the muscular structure of the heart serves, in some measure, to deaden the intensity of the murmur, as audible by means of the stethoscope.

it would be if a much smaller amount of blood were to be driven less forcibly past the same obstruction: and so with every variety of lesion. The character of the sound itself, as well as its intensity, must obviously vary according to the exact nature of the mischief and the relative power and proportion of the obstructing and the propelling forces. Sometimes the sound has been supposed to resemble the noise produced by rasping or sawing, and in some cases it has been thought like the cooing of a pigeon; but generally it is suggestive of the blowing of a pair of bellows, and hence the sound produced by valvular disease, whatever its character or musical intonation, is usually known by the title of "a bellows-murmur."

By the commencement of a bellows-sound, then, we are apprised of the access of endocardial inflammation; and by the position of the sound, by the direction in which it is heard, by the time at which it occurs, and by the state of the pulse, we are enabled to judge, with amazing accuracy, of the site of the lesion from which it originates. If the murmur be synchronous with the systole of the heart, it must obviously accompany the egress of blood *from* the ventricle, and therefore must be referable either to obstruction at the aortic orifice, or to regurgitation through the mitral valve.¹

¹ In this instance, and indeed throughout, I have referred to valvular disease on the left side of the heart only, as rheumatic affection of the valves of the right cavities is exceedingly rare, and its diagnosis somewhat uncertain. Should it occur, however, it may be generally recognised by the fact, that the tricuspid murmur is heard further to the right than the corresponding mitral murmur, and that disease of the pulmonary semilunar valves occasions a murmur which is more superficial in its character than a corresponding aortic murmur, and is audible along the track of the pulmonary artery, instead of along the course of the aorta and large vessels.

If it be contemporaneous with the diastole of the heart, it must accompany the entrance of blood *into* the ventricle, and therefore must be due either to obstruction at the mitral orifice, or to regurgitation through the aortic outlet. But then comes the question as to the means of distinguishing the two systolic murmurs from one another, and of discriminating between the two diastolic murmurs. How can we refer each to its own particular valve? Partly, as already stated, by its position, partly by the direction in which it is heard, and partly by the character of the arterial pulse. If a murmur accompanying the systole of the heart be heard more distinctly at the base of that organ, and along the track of the aorta, than it is towards the apex of the heart, then is it due, in all probability, to a vibration caused in the onward current of the blood by obstruction at the aortic outlet of the ventricle; and this is rendered still more probable if the pulse at the wrist be weak. If, as I have several times had occasion to observe, more especially in cases of old standing rheumatic disease of the heart, the murmur be heard along the track of all the larger vessels, if it be perceptible in the carotids, and, as it sometimes is, in the wrist, and if accompanying this murmur a thrill be felt, not only over the region of the heart, but even in the radial artery, there cannot any longer be a doubt on the subject, as obstruction in the course of the arterial circulation could alone give rise to such phenomena. If, on the other hand, the murmur be heard at the apex and to the left of the heart more distinctly than at the base of that organ; and if, accompanying this systolic murmur, there be irregularity in the arterial pulse, and great inequality in its force and fulness, then is the disease situated at the mitral orifice. In this case, as in the last, the murmur is produced by the passage of the blood through the roughened, or the rigid and contracted valvular opening,

and the pulse is rendered irregular and unequal by the constant variation in the quantity of blood which, at each contraction of the ventricle, regurgitates, or makes its way back through the imperfect valves into the left auricle. And as in the last case, so also in this, a vibration is often communicated to the chest, causing a thrill or purring tremor distinctly perceptible to the touch; a thrill, however, which, unlike that which occurs when there is obstructive disease of the aortic valves, is occasioned by a backward, instead of by an onward current of blood, and consequently is not transmitted to any extent along the aorta and the various arterial tubes.

The diagnosis then between the two systolic murmurs is clear and satisfactory, and that between the two diastolic murmurs is equally simple and conclusive. If, which is not very frequently the case, the mitral valve be so diseased as to cause sonorous vibration in the blood passing from the left auricle to the left ventricle, then will the murmur be heard most distinctly about the middle of the sternum, and thence towards the apex of the heart; the pulse, owing to the obstruction, will be small, and, unless either the quantity of blood ejected at each systole of the heart, be insufficient to cause the aorta valves to flap distinctly, or their sound be drowned by the adventitious murmur, the natural short smart clack, occasioned by their sudden tension, will be heard superadded to or accompanying the murmur.

But if the abnormal sound arises from the reflux of blood through defective aortic valves, the signs produced will be very different. Not only will the sound be loudest from about the middle of the sternum upwards towards the base, instead of downwards towards the apex, of the heart, but in lieu of being heard together with the natural second sound, it will almost or entirely replace it. Moreover, it

will be heard along the course of the aorta, and all the large arterial trunks, and will be accompanied by a most singular and characteristic pulse. This, the pulse of aortic regurgitation, derives its peculiarity from mechanical causes. It is not the weak pulse of aortic obstruction, nor the small pulse of mitral obstruction, nor the unequal and irregular pulse of mitral regurgitation, but in its most marked and most striking form, it is the unsustained pulse of unobstructed arteries. There is, in this case, no impediment to the onward current of the circulation, no lack of blood to fill the vessels, and no deficiency of power to propel it, but from the imperfection of the aortic valves, and the consequent reflux of blood into the ventricle, the prolonged swell, which, at each systole of the heart, is naturally imparted to the blood in the vessels, is not sustained; the successive waves are, therefore, short and abrupt, and hence the pulse is jerking, and gives a sensation as if successive balls of blood were being shot suddenly under the finger. So strong is this reflux, and so strong the jerking to which it gives rise, when it exists in any marked degree, that the motion occasioned by it may be seen even at the wrist, and may be felt in almost any part of the body.¹

The lesions then produced by rheumatic affections of the heart, when existing in a well-marked and uncomplicated form, admit of easy diagnosis, and may soon be recognised,

¹ In illustration of this, Dr. Watson details the particulars of a very remarkable case. "The shock of this man's artery," he says, "was plainly to be felt through his clothes, by one's hand laid lightly upon the bend of his arm. His wife told me, that for five years past, this jarring blow had made it uncomfortable for her to take his arm, when they were walking together. The same kind of jerking impulse was strikingly perceptible in the femoral arteries, and in the carotids." ('Practice of Physic,' p. 256, 1st ed.)

even by an unpractised ear. But they are often found more or less commingled, two or more of them occurring in the same case, and thus their diagnosis may be greatly complicated. The pericardium may be inflamed coincidentally with inflammation of the mitral valve, and then a deep-seated systolic bellows-murmur, resulting from mitral disease, may be heard at the same time that the ear is assailed by the loud superficial to and fro sound of friction. Sometimes there is a *double* bellows-murmur, the one accompanying the systole, and the other the diastole of the heart, and this may be occasioned either by disease of a single valve, or by disease of two separate valves; either by disease of a single valve, of such a nature as both to cause obstruction and admit of regurgitation, or of two separate valves, the one giving rise to the obstructive, the other to the regurgitant murmur. Thus, not unfrequently a loud systolic aortic murmur coexists with an aortic diastolic murmur, and occasionally a systolic mitral murmur occurs coincidentally with an aortic diastolic murmur. Sometimes there is even a greater complication, and a systolic murmur, arising in part from mitral regurgitation, in part from aortic obstruction, is followed by a diastolic murmur, occasioned partly by mitral obstruction, and partly by aortic regurgitation. Difficulty also repeatedly arises from the fact that one morbid sound may be so loud and prominent as to mask and render almost inaudible another, which, under other circumstances, would have announced, in plain and fearful tones, the existence of disease at some other part. But in all these cases the form or forms of diseases which exist may be discovered, and their combinations pointed out, by careful attention to the rules I have laid down—by careful attention to the character and position of the abnormal sound, to the direction in

which, and the time at which, it is heard, and to the state of the arterial pulse.

Our diagnosis, however, is not, in all cases, so certain or so perfect as could be wished. In practice, many difficulties present themselves which cannot be resolved solely by attention to the sounds themselves. Sometimes, for instance, at the commencement of an attack, it is difficult to determine whether a sound, evidently abnormal, but of an indistinct indefinite character, be referable to endocardial or exocardial mischief, and it is only by the effect of firm pressure in the cardiac region, and by the variation in the character of the sound observed in the course of oft-repeated examinations, conducted while the patient is in different postures, that it is possible to arrive at a correct conclusion.

So, also, it sometimes happens that an ill-developed indefinite sound, having its origin in the heart or its membranes, so closely accompanies the respiratory movements as to make it doubtful whether it may not arise from the lungs or pleuræ. Here, again, the position of the sound affords no information, but the question may be set at rest by making the patient hold his breath, when, if it be connected with the respiratory organs, it will instantly cease, but will continue as before if referable to the heart.

Again, it is frequently doubtful whether an endocardial murmur, arising in the course of acute rheumatism, may not be due to functional causes. The question is one, the decision of which admits not of delay, as on it depends the nature of the treatment, and the well-being of the patient. Here our powers of discernment are taxed to the utmost, for it is only by reference to the appearance of the patient, the treatment which has been adopted, the nature of the symptoms by which the accession of murmur has been accompanied, and the position and character of the sound itself, that it is possible to arrive at a sound conclusion.

According as the patient is pale and exsanguine; as the murmur varies with the posture of the patient, and is constantly or only occasionally present; as it is heard most distinctly at the apex, or at the base of the heart, and in the track of the aorta, or of the pulmonary artery; as it is soft and blowing, or harsh and rasping; as it is more or less superficial; and as its accession has been attended or unattended by pain and dyspnœa, by fluttering or irregularity of the pulse, or by evidence of increased cardiac action, so must be our judgment. No certain rule can be laid down to enable the practitioner to estimate correctly the importance of each indication; but any one who is cautious, and watchful for the accession of cardiac inflammation, will not fail to give a significant interpretation to præcordial pain and increased or irregular cardiac action; whilst, on the other hand, he will not over-estimate the importance of a systolic murmur, if it occurs in a pale and weakly person who has been sweated profusely, or has undergone venesection, more especially if it be unaccompanied by pain and by increased or irregular action of the heart, and be heard most distinctly in the track of the pulmonary artery.

Thus by paying careful attention to the circumstances which characterize each case, we may generally arrive at a correct conclusion, and if we are sometimes unable to do as much as might be wished towards arresting the progress of the disease, and repairing the damage it has occasioned, it is at least satisfactory to be able to detect its existence, and to feel that, being aware of its nature, we are in a position to do all that can be done for its alleviation or cure.

I have hitherto spoken only of the *physical* signs of rheumatic carditis, which are those on which we must chiefly rely for the detection of commencing mischief about

the heart, but the *general* symptoms are also of considerable importance by directing attention to the seat of inflammation and exciting alarm for the safety of the patient. As soon as active mischief has commenced, the whole aspect of the patient is rapidly changed,¹ his countenance, which only a short time before had been calm and tranquil, becomes anxious, and his whole manner and deportment show but too clearly that serious mischief has supervened. Sometimes he is restless, more generally he lies quietly flat on his back, and evinces inability or much disinclination to lie on his left side. The breathing, which before had been unaffected, becomes hurried and shallow, and often accompanied by a short dry cough; he complains of uneasiness and oppression at the epigastrium, and of pain in the præcordial region, increased on every attempt at full inspiration, as also by pressure with the fingers in the intercostal spaces, or under the cartilages of the false ribs on the left side. He suffers from palpitation, not unfrequently feels faint, and sometimes experiences a sharp pain, almost resembling a paroxysm of angina, shooting through the chest to the scapula, or upwards to the clavicle or the left shoulder.

These symptoms are usually more marked in cases of pericarditis than in those in which the endocardium only is affected. Moreover they are apt to vary according to the nature of the inflammatory products. The more solid the character of the inflammatory exudation, and the smaller the amount of serum poured out, the less constrained is the

¹ Dr. Hope, in noticing this peculiar anxiety of countenance, remarks, "The sardonic expression and peculiar contortion of the features attending the worst cases of pericarditis, are occasioned by the sympathy subsisting between the respiratory nerves of the face and those of the heart. An impression is conveyed to the spinal cord through the pneumogastric nerves, and is reflected to the face through the portio dura."

patient in his posture, the less disposition does he manifest to syncope, and the longer, *cæteris paribus*, does his pulse retain its force and regularity. On the other hand, the larger the quantity of serum poured out—the more the pericardial sac is distended—the greater is his reluctance to move or change his posture, the greater the disposition to fainting, and the more feeble, irregular, or intermittent his pulse. Indeed, when the effusion is very great, whatever position he may have assumed, whether on his back or on his side, or sitting erect, or leaning forward with his arms upon his knees, so fearful is he of accelerating his heart's action, embarrassed as it is by the amount of liquid, that he cannot be induced to change his posture.

These symptoms of cardiac inflammation are extremely striking, and might be deemed sufficient of themselves to indicate the existence and nature of the mischief; but unfortunately they are not very distinctive, nor are they very constant in their occurrence. Generally, indeed, when the heart is attacked, some pain, dyspnœa, irregularity of the pulse, or some other indication of existing disease, draws attention to the seat of mischief. But I have repeatedly seen cases in which most acute pericarditis has been set up and has continued for some days, without the supervention of any symptoms likely to direct attention to the action which was going on; and instances not unfrequently occur in which from first to last such general symptoms are altogether absent.¹ Therefore when treating a case of acute rheumatism we must never neglect to make a careful examination of the chest as day by day we watch the pro-

¹ Cases such as these, in which carditis has been unattended by any local symptoms, are familiar to all practical men, and instances have been placed on record by Drs. Andral, Burrows, Latham, Stokes, Watson, and others.

gress of the disease. Absence of pain, and other general symptoms of cardiac affection, may serve to mislead the unwary, and to beguile them into the idea that the rheumatism is running its ordinary course; but the more cautious and intelligent practitioner will be aware that the absence of such symptoms affords no guarantee for the safety of his patient, and by repeated daily examination of the heart he will satisfy himself that he is not allowing a frightful disease to run on, unheeded and unchecked, in its career. He will listen for the to and fro sound of pericardial friction, and for the bellows-murmur, which announces the commencement of endocardial inflammation, and as soon as his ear shall have given him notice of their existence, either separately or together—nay, even before the sounds are fully formed, if from the occurrence of pain, the acceleration or irregularity of the heart's action, or from any prolongation or roughness of its sounds, he has reason to suspect the commencement of inflammation—he will at once endeavour to arrest its progress by active and appropriate treatment. Nor will he rest satisfied with having discovered its existence; he will take every means to trace its progress in order that he may be able to apportion his remedies to the exigences of the case, and speak with some certainty as to the issue. If pericarditis be present he will listen anxiously, day by day, for some increased clearness in the cardiac sounds, and some diminution in the intensity of the friction-sound, or in the extent of area over which it is heard, and, by careful percussion in the præcordial region, he will ascertain whether the effusion into the pericardial sac be, or be not, in process of absorption. In like manner, if the endocardial membrane be inflamed, he will constantly note the increase or the decrease in the force, frequency, and regularity of the heart's action, and in

the intensity of the adventitious bellows-murmur, and according to the information his ear affords him, so in great measure will he vary his treatment, and form a favorable or unfavorable diagnosis.

I have hitherto made no mention of one peculiar train of phenomena which sometimes accompany rheumatic carditis, because, in the first place, their occurrence is somewhat rare; and, in the second, they are apt to divert attention from the real seat of mischief, and are, therefore, deserving of especial notice. I allude to phenomena resulting from disturbance of the cerebral functions. It has been already stated that a great alteration is usually observed in the expression of the patient, and that excessive restlessness sometimes supervenes as soon as inflammation of the heart is set up. In some instances, this excitement of the nervous centres proceeds to a very much greater extent. The restlessness and anxiety pass into delirium, into quiet or into low muttering delirium, often attended with stupor; or, on the other hand, into wild uncontrollable delirium, into the delirium of mania, accompanied sometimes by tetanic spasms or by convulsions, which terminate either in extreme exhaustion or in death by coma. Such cases have been long recognised by the profession, and instances in point have been placed on record by many accurate and observant physiologists.¹ In many respects they are very remarkable. They present all the symptoms usually observed in cases of meningeal or cerebral inflammation, yet are seldom connected with any structural change within the cranium which can be regarded as indicative of inflamma-

¹ In France, by MM. Andral, Bouillaud, and Rostan; and in this country, by Drs. Abercrombie, R. Bright, Burrows, Davis, Latham, Todd, Watson, and others; several striking cases of this sort are detailed in Cap. X, of this Treatise.

tory action. Sometimes, indeed, on dissection after death the cerebral veins have been found gorged, and some little serum has been discovered effused under the arachnoid, or into the ventricles of the brain, but this has been by no means a constant occurrence, and even had it been so, would only have shown that in this, as in all other forms of violent delirium, the circulation in the brain is apt to be interfered with, and serum poured out in consequence. But though in most of these instances there has been no vestige of active mischief within the cranium, it has been generally far otherwise with the heart or its investing membrane. Serum and recent lymph have been found effused into the pericardium, or the endocardial membrane has been inflamed, and recent fibrinous vegetations have been scattered irregularly over the surface of the left auricle, or deposited, in the shape of fringes, along the edges of the valves. Indeed, so constantly has cerebral disturbance been associated with mischief about the heart, that many have been inclined to regard delirium, occurring in acute rheumatism, as invariably the result of changes going on in the central organ of the circulation. The coincidence is certainly sufficiently frequent to render it imperative upon every practitioner to examine most carefully into the condition of his patient's heart, whenever symptoms of flightiness or delirium begin to manifest themselves; but it must not be concluded, without examination, that the heart is certainly the seat of mischief, for cerebral disturbance does occasionally arise, in acute rheumatism, as a result of cerebral or meningeal inflammation; more frequently in connection with pneumonia or pleuritis; and sometimes, though rarely, without any local internal inflammation. In these cases, again, the stethoscope affords invaluable assistance, inasmuch as it enables us to ascertain with certainty whether there be, or

be not, mischief about the heart or lungs. If we fail in detecting mischief in the chest, we must direct our attention to the brain and its envelopes, whilst, if we discover cardiac or pulmonary inflammation, our aim should be to subdue the morbid action there taking place, in the hope that the cerebral disturbance may be sympathetic of the cardiac or pulmonary mischief, and may subside coincidently with its cessation.¹

In summing up the principal facts deserving of notice in reference to rheumatic inflammation of the heart, I should say that it is incidental to all the stages of acute rheumatism, occurring sometimes before the commencement of inflammation of the joints, and possibly also, in some rare instances, without the concurrence, from first to last, of any active articular symptoms: it arises less frequently towards the close of the disease, when tending to a favorable termination, than it does at its beginning or during its progress: it supervenes most frequently in acute attacks of the disease, more especially when inflammation attacks many joints, and manifests a disposition to shift its quarters: and it is much more commonly met with in the young than in those more advanced in years; more frequently in the irritable than in those of a phlegmatic temperament; more usually in those in whom the fibrous structures about the joints are chiefly affected, than in those who suffer principally from synovial inflammation. As the general symptoms of its accession are variable and uncertain, and are sometimes altogether absent, the physical signs, which are very characteristic, should be jealously watched for, the chest being examined daily by the stethoscope and by percussion throughout

¹ For full particulars regarding the cerebral symptoms which occur in connection with rheumatism, see Cap. X, of this Treatise.

the progress of the disease. On the first indication of cardiac mischief, active means should be taken to prevent its continuance, and, throughout its course, the physical signs should be carefully attended to, as affording the only certain evidence as to the action of the remedies and the progress of the disease, whether towards a favorable or unfavorable termination. *Cæteris paribus*, the prognosis should be more unfavorable in cases accompanied by a copious effusion into the pericardium, with great irregularity of the heart's action, than in those in which a smaller quantity of serum is poured out, and the heart is less embarrassed; more guarded in those accompanied by much constitutional depression than in those marked by tolerance of remedial measures; more cautious when, together with the cardiac inflammation, there coexists inflammation of the lungs or pleura, than when the respiratory organs are unaffected; and much more unfavorable in cases complicated by cerebral disturbance, than in those in which the intellect remains unclouded.

The subjoined abstract of 16 cases of acute rheumatism which proved fatal, in St. George's Hospital, under the care of the physicians, during the six years ending Dec. 31, 1850, will show the important part which cardiac inflammation ordinarily bears in producing a fatal termination, as also the age and sex of the sufferers, and the general character of the post-mortem appearances.¹

¹ In the Post-mortem Register preserved in the Museum of St. George's Hospital will be found full particulars of all these cases. The history of those which occurred prior to May, 1848, is reported by myself; of those which occurred subsequently to that date, by Dr. Barclay, who succeeded me as Medical Registrar of the Hospital. The post-mortem appearances are recorded by Mr. Prescott Hewett, Mr. G. D. Pollock, Dr. Handfield Jones, Mr. Gray, and Mr. Holl, the successive curators of the Museum.

The ages of the patients were thus distributed :

	Male.	Female.	Total.
Fatal cases, under the age of . . . 15	1	1	2
„ between the ages of 15—20	3	4	7
„ „ 20—25	2	1	3
„ „ 25—30	2	2	4
Total	8	8	16

The particulars of these cases are given below. One other case, which occurred in the person of a man, æt. 27, proved fatal, in the year 1846, but, as no post-mortem examination was made, I have omitted all mention of the symptoms during life.

History.

Case 1.—*Mary Ann Harrison*, æt. 14.—No previous attack of acute rheumatism.

Ailing 13 days. Redness and swelling of the joints, and pneumonia, 13 days before her death.

Pericarditis and endocarditis, 4 days.

Occasional delirium, and choreic twitching of the voluntary muscles, 3 days.

Post-mortem Examination.

The Joints and Sheaths of Tendons were slightly increased in vascularity, and contained a thick, tenacious fluid, in which numerous irregularly granular globules were discovered by the microscope. There were no true pus-globules.

In the Pericardium was serum, with large quantities of recently effused lymph, which here and there had formed

slight adhesions between the two layers of the pericardial membrane.

The Mitral and Aortic Valves were red and swollen, and presented on their surface and edges of contact, recent fibrinous vegetations of a pink colour.

The Left Lung was in a state of red hepatization almost throughout.

The Right Lung was loaded with red, frothy serum, and in one or two parts was passing into the condition of red hepatization.

The Kidneys, Liver, and other Viscera were healthy.

History.

Case II.—*Frances Webster*, æt. 18.—One previous attack of acute rheumatism 3 years ago.

Ailing 51 days. Inflammation of the joints, 44 days before her death.

Pericarditis and endocarditis, 43 days.

Pleurisy and pneumonia, 30 days.

Slight peritonitis, 4 (?) days.

Post-mortem Examination.

Joints not examined.

Pericardium universally adherent to the heart by soft, recent adhesions, in which minute anastomosing red lines could here and there be traced.

Mitral and Aortic Valves loaded with recent fibrinous vegetations.

Right Pleural Cavity contained an immense quantity of recent lymph and serum.

Left Pleural Cavity contained recent lymph and serum, though in a smaller quantity.

Right Lung inflamed in the lower part; the remaining portions of its structure carnified by pressure.

Left Lung inflamed; loaded with red, frothy serum, and in parts hepatized.

Slight Peritonitis, with recent adhesions between the liver and diaphragm.

Kidneys, Liver, and other Viscera healthy in structure, but congested.

History.

Case III.—*Thomas Howship*, æt. 16.—No previous attack of acute rheumatism.

Suffering 12 months from an eruption, resembling ichthyosis, on the legs.

Redness and swelling of the joints supervened suddenly, 11 days before his death, on the rapid subsidence of the cutaneous eruption. For two days before the rheumatism showed itself in the joints, he had alternate vomiting and diarrhœa, which ceased immediately on the appearance of the articular symptoms.

Inflammation of the kidneys, 5 days. Pericarditis, 4 days. Double pleurisy, 4 days.

Occasional delirium and slight opisthotonos, 2 days.

Urine contained pus and blood.

Post-mortem Examination.

Joints not examined.

Pericardium excessively injected, and coated with a thick layer of recent lymph, and containing, in its cavity, serum, shreds of lymph, and a small quantity of pus.

Valves healthy.

Recent adhesions of the Pleuræ at the lower part on either side.

Lungs congested, but still crepitant.

Kidneys congested. Mucous membrane of the pelvis, infundibula, and calices, inflamed and covered with a large quantity of recently effused lymph.

Liver and other Viscera healthy.

History.

Case IV.—*James Palmer*, æt. 27.—One previous attack of acute rheumatism 18 months ago, and palpitation ever since.

Rheumatism, with occasional redness and swelling of the joints, 2 months, for which he was admitted into the hospital.

Slight papular cutaneous eruption 20 days before death.

Rigors, with alternate diarrhœa and vomiting, followed by great increase of the rheumatic symptoms, and relief of the sickness and purging, 4 days.

Erysipelas of the face, 2 days. Delirium, 1 day.

Post-mortem Examination.

Joints.—Right knee and left wrist contained a large quantity of viscid fluid mixed with lymph and pus. The synovial membrane lining these joints was extremely vascular. The sheaths of the tendons at the back of both wrists contained a quantity of thick puriform fluid, but the tendons at the fore part of the joints were healthy. The synovial membrane lining the left knee-joint was somewhat increased in vascularity, and the joint contained a larger quantity of synovia than natural, but the fluid was healthy in appearance.

Pericardium universally adherent to the heart by old adhesions, and adherent also to the anterior parietes of the chest.

Valves healthy.

Lungs healthy.

Kidneys congested, and coarse in structure, but smooth on their surface.

Liver and other Viscera congested, but healthy in structure.

History.

Case v.—*Jane Lawes*, æt. 16.—Had an attack of acute rheumatism 10 weeks ago, followed by irregular rheumatic pains, which have continued ever since.

Second attack ushered in by rigors, followed by inflammation of the joints, 23 days before her death.

Pericarditis, from 17 to 23 days?

Pleurisy, 11 days.

Post-mortem Examination.

Joints.—Both knee-joints were examined, but no traces of inflammation were found remaining.

Pericardium enormously distended by serum tinged with blood, and containing masses of lymph floating in it. The free surfaces of the pericardium were covered by a very thick coating of recent lymph, and had contracted partial adhesions with each other at the posterior surface and at the apex of the heart.

Endocardium on the left side white and opaque, but without vegetations.

Valves otherwise healthy.

Right Pleural Cavity, obliterated partly by old, partly by recent adhesions.

Left Pleural Cavity contained a small quantity of recently effused lymph and serum.

Lungs congested, and the lower lobe of the left one compressed by the distended pericardium.

Kidneys large and congested, but healthy in structure.

Spleen soft and grumous, with numerous white corpuscles in its structure.

Other Viscera congested, but healthy in structure.

History.

Case VI.—*Edward Jeynes*, æt. 27.—No previous attack of acute rheumatism.

Had scarlatina 3 months ago, and had never been well since.

Redness and swelling of the joints supervened 6 days before death.

Insensibility and stertorous breathing came on while he was in a vapour bath, and he died in about 20 minutes.

Post-mortem Examination.

Joints.—Healthy in appearance. Unusual quantity of synovia in the elbow-joint.

Cranium.—Membranes healthy. Brain not abnormally congested: healthy in structure. Ventricles contained the usual quantity of clear fluid. Veins at the upper surface of the hemispheres were very turgid, and filled with thick dark fluid blood. Arteries at the base of the brain quite healthy.

Pericardium in one part presented increased vascularity,

and its cavity contained a small quantity of opaque fluid, in which were floating some small specks of fibrin.

Heart somewhat dilated, and its muscular structure flaccid. Walls of left ventricle thinner than natural. Valves quite healthy. Endocardium deeply blood-stained. Blood fluid, thick and dark coloured.

Lungs congested, discoloured, and somewhat emphysematous anteriorly. Otherwise healthy.

Spleen pale, soft, and pultaceous, and somewhat larger than natural.

Kidneys and other Viscera healthy.

History.

Case VII.—*Sarah Woodason*, æt. 29.—One previous attack of acute rheumatism 10 years ago.

Frequently suffered from wandering rheumatic pains during the last 10 years.

Long out of health, suffering from leucorrhœa and relaxed sore throat.

Repeated rigors, followed by very severe wandering pains, with profuse acid perspirations 23 days before her death.

Inflammation of the joints 18 days before her death.

Profuse perspiration, mercurial diarrhœa. Sloughing of the back and hips.

Post-mortem Examination.

Sloughs over both Trochanters, which had burrowed some distance under the integuments.

Joints.—In the left wrist-joint was a greatly increased quantity of synovial fluid, mixed with a small quantity of pus. In the left knee-joint was an increased quantity

of synovia, which was thicker and more yellow than natural ; and floating in it were two large pieces of lymph, the largest nearly 3 inches in length, and a quarter of an inch broad at its greatest diameter.

Pericardium contained a small quantity of serum, and at the base of the left ventricle presented a small spot of ecchymosis and some increased vascularity ; and at this spot was a small speck of lymph, which could be easily peeled off.

Valves.—Mitral valve somewhat thickened. Aortic valves healthy.

Slight recent adhesions of the Pleuræ existed at the upper and outer side of the chest on either side.

Lungs congested, but healthy.

Kidneys, Liver, and other Viscera healthy.

History.

Case VIII.—*George Smith*, æt. 16.—One previous attack complicated by inflammation of the heart 2 years ago.

Present attack commenced with wandering pains in the limbs 21 days before his death.

Increase in the severity of the pains, 18 days.

Profuse rheumatic perspiration, but no redness or swelling of the joints.

Pericarditis, 18 days.

Died suddenly.

Post-mortem Examination.

Joints not examined.

Pericardium almost universally adherent to the heart, partly by old adhesions, partly by more recently effused

lymph. At the root of the large vessels the lymph was still soft and jelly-like.

Heart enormously enlarged, and somewhat hypertrophied. The cavity of the left ventricle would almost admit the entire hand.

Valves.—The aortic and mitral valves were both somewhat thickened, and the aortic rather rigid. The tendinous chords of the mitral valve were remarkably developed.

Lungs congested, but crepitant and healthy.

The Kidneys, Liver, and other Viscera healthy.

History.

Case ix.—*Richard Huntley*, æt 17.—No history of any previous attack of rheumatism.

Redness and swelling of the joints commenced 27 days before death.

Pericarditis between 18 and 27 days. The exact period uncertain. It existed at the time of his admission into the hospital, when also he was in a state of salivation.

Endocarditis. Exact period of its commencement uncertain.

Pneumonia about 12 days.

Pleurisy about 5 days.

Large abscess in the left axilla, stated to have existed from the beginning of the attack.

Slight delirium previous to death.

Post-mortem Examination.

Joints not examined.

Pericardium contained a large quantity of blood-stained serum. Its free surface was covered throughout by a thick

layer of recent lymph, some of which was deeply blood-stained, and some of which also was becoming organized, and presented a vascular appearance.

Valves.—Mitral more opaque than natural, somewhat swollen, and loaded on the auricular side with recent pink fibrinous deposits. Along the edges of contact, on the ventricular surface of the aortic valves, were recent fibrinous vegetations.

Right Pleural Cavity contained a large quantity of blood-tinged fluid.

Left Pleural Cavity contained blood-stained fluid, and at its lower part a small quantity of recent lymph, forming a coating to the lung in that situation.

Right Lung gorged with frothy serum, and at its lower and back part were several patches of red hepatization.

Left Lung was also gorged with frothy red serum, and presented several patches of red hepatization.

The Right Kidney appeared somewhat coarse; *the Left*, congested, but healthy.

The Liver, Spleen, and other Viscera, congested, but perfectly healthy in structure.

History.

Case x.—*Elizabeth Moore*, æt. 20.—No history of any previous attack of acute rheumatism.

Was confined about nine weeks and a half before her death, and the catamenia appeared once afterwards.

Wandering rheumatic pains five weeks and a half before death.

Redness and swelling of the joints began 23 days before death.

Pericarditis, 16 days. Endocarditis, 15 days?
Bronchitis, 15 days.

Post-mortem Examination.

Joints not examined.

Pericardium much distended by serum, mixed with flakes of lymph; the whole of its free surface was covered by a thick coating of lymph.

Valves.—Along the edges of the mitral valve, on the auricular surface, was a small fringe of recent fibrinous vegetations; and the ventricular surface of the aortic valves was slightly coated with recent lymph.

The Pleuræ were partially adherent by old firm adhesions, but presented no trace of recent inflammation.

The Lungs were loaded with serum and frothy mucus, but were crepitant throughout, and, anteriorly, somewhat emphysematous.

The Kidneys, Liver, and other Abdominal Viscera were congested, but healthy.

History.

Case XI.—*Elizabeth Adams*, æt. 30. No previous attack of acute rheumatism.

Present illness began, without previous indisposition (?), by redness and swelling of the joints, 12 days before death.

Pericarditis and endocarditis from 9 to 5 days before death.

Post-mortem Examination.

Joints not examined.

Pericardium contained a small quantity of serum. The

membrane itself was highly vascular, and covered by a coating of recently effused lymph.

Heart.—Tissue flaccid; under the microscope a large number of oil globules were detected in its structure.

Valves.—Aortic healthy. Mitral fringed with recent fibrinous vegetations, which extended over both its auricular and ventricular surfaces.

Pleuræ and Lungs healthy.

Liver much enlarged, and very fatty in appearance.

Kidneys somewhat coarse in structure and granular on their surface.

Spleen, Uterus, and other organs, congested.

History.

Case XII.—*Catherine Doyley*, æt. 17. Two previous attacks of acute rheumatism.

“Out of sorts,” and suffering from hysteria six days before the commencement of redness and swelling of the joints, which began 18 days before her death. Inflammation of the joints only lasted two or three days.

Pericarditis and endocarditis 13 days before death.

Pleurisy 5 or 6 days. Sank gradually.

Post-mortem Examination.

Joints not examined.

Pericardium.—Thickly covered on its free surface by a coating of recent lymph, which had contracted tolerably firm adhesions, gluing the visceral and parietal layers of the membrane together throughout their whole extent, excepting on the outer side corresponding to the outer side of the right ventricle.

Heart.—Its cavities dilated and its walls hypertrophied, particularly those of the right side.

Valves.—Mitral, somewhat thickened and covered on its auricular surface, and more particularly along its edges of contact by recent fibrinous vegetations. Similar vegetations were also found on the ventricular side of the aortic valves, along their edges of contact. Valves on the right side healthy.

Partial old adhesions of the right pleura.

Right Lung infiltrated by frothy serum.

Partial old adhesions of the left pleura, and effusion of serum, and recent lymph at the lower part of the pleural cavity, gluing the lobes of the lung together, and its base to the serous lining of the diaphragm.

Left Lung infiltrated by frothy serum.

Kidneys healthy.

Liver healthy, but its capsule thickened by the effusion of fibrin into its structure.

Spleen contained numerous deposits of fibrin about the size of a millet seed.

History.

Case XIII.—*John Hodges*, æt. 21. No history of any previous attack of acute rheumatism.

Seized with pain in the head, and wandering pains in the limbs 8 days before death.

Redness and swelling of the joints began 5 days before his death.

Heart symptoms, 5 days.

Had a slight fit with ptosis of one eyelid a few hours before death.

Post-mortem Examination.

Joints.—Both knee-joints contained a quantity of whitish, opaque, glairy fluid, which appeared under the microscope to be synovia containing a large number of pus-corpuscles. The synovial membrane was highly vascular.

Pericardium contained about 4 ounces of an opaque fluid, in which floated numerous shreds of lymph. The free surface was covered by a coating of recent lymph, which, on the anterior surface of the heart, had begun to contract adhesions. The membrane was highly congested, and in one or two spots presented small patches resembling ecchymosis.

Valves healthy.

Both Pleural Cavities contained a small quantity of thin transparent serum.

Both Lungs were quite healthy and crepitant throughout.

Kidneys, Liver, and other abdominal organs congested, but healthy.

A large clot of fibrin resembling jelly both in appearance and consistence, was found in the cavity of the pelvis. There was no trace of inflammation there.

History.

Case XIV.—*Ann Amess*, æt. 21.—Slight rheumatism one year ago, but no previous acute attack.

Inflammation of the joints 17 days before death.

Palpitation and pain in the chest, 10 days.

Miliary eruption of sudamina, 7 days.

Delirium, more or less, 3 days ; violent, 12 hours.

Post-mortem Examination.

Joints.—The synovial membrane of both knee-joints was highly vascular and red. In the cavity of the joints was a quantity of turbid, yellow serum, in which floated masses of coagulated lymph, one of which was deeply stained with blood. The cartilages of the joints were clear and white.

Brain presented nothing remarkable.

Pericardium contained a small quantity of slightly turbid serum.

Heart and Valves perfectly healthy.

Lungs healthy; a few old adhesions existed in the right pleural cavity.

Peritoneum contained a small quantity of turbid serum.

Liver, Kidneys, and other Viscera in the abdominal cavity congested, but healthy.

History.

Case xv.—*Mark Mindenhall*, æt. 12.—Several previous attacks of acute rheumatism; one when he was 6 years old.

Ailing, 18 days.

Inflammation of the joints, 15 days.

Palpitation and endocarditis, at least 11 days.

Pericarditis, 7 days.

Pneumonia. Duration uncertain.

Pleurisy. Occasional delirium. Excessive dyspnœa.

Post-mortem Examination.

Joints not examined.

Pericardium contained some serum, and a large quantity of lymph, which had formed partial slender adhesions over the ventricles.

Heart somewhat hypertrophied and dilated.

Valves.—Recent fibrinous vegetations on the mitral and aortic valves. Old thickening of the mitral valve. Slight recent thickening of the tricuspid valve.

Right Pleural Cavity contained several ounces of serum, mixed with recent lymph.

Lungs congested throughout; in the lower half on either side inflamed, and in parts in a state of grey hepatization.

Kidneys, Liver, and other Abdominal Viscera congested, but healthy.

History.

Case XVI.—*William Davis*, æt. 25.—No previous attack of acute rheumatism. Rheumatic symptoms began 14 days before his death.

Delirium with much tremor, more or less 3 days. Furious, 1 day.

Pericarditis a few hours.

Post-mortem Examination.

Joints.—Right sterno-clavicular articulation softened, and surrounded by thick yellow pus. Pus also in the left elbow and in the right ulno-carpal articulation, and extending along the tendons.

Membranes of the Brain congested. Slight effusion in the sub-arachnoidean cellular tissue.

Brain congested. Ventricles filled with serous fluid.

Pericardium contained a small quantity of turbid serum, and on the surface of the left auricle was a small quantity of plastic lymph.

Valves perfectly healthy.

Lungs and Pleuræ healthy.

Kidneys, Liver, and other Abdominal Viscera, healthy.

CHAPTER VIII.

RHEUMATIC INFLAMMATION OF THE HEART, ITS TREATMENT.

HAVING traced the causes and described the symptoms of Rheumatic Carditis, it now only remains for me to discuss its treatment. How far is it possible to prevent its occurrence? How, when it has once commenced, can its course be controlled, or its progress arrested? How, when its active symptoms have been subdued, can the lesions it has left behind be modified or got rid of? Can we fairly hope to cut short an attack of pericarditis, to induce absorption of the matters effused, and to prevent adhesion of the two layers of the pericardium? Or, when inflammation of the endocardium has been set up, can we fairly anticipate a victory over the disease, and a restoration of the conditions of health? These are indeed important questions, and demand our full and anxious consideration.

I have already stated my conviction, that when once pericarditis or endocarditis has commenced, recovery, in the strict sense of the word, is extremely improbable. There may be apparent recovery; the patient may so far get well as to resume his ordinary occupations, and, if they be not laborious, he may live for years, without experiencing much ill effect from his attack of rheumatism.

But in most cases his subsequent career will be short, and exceedingly distressing. Before many years have elapsed, he will begin to suffer from asthma and palpitation, as the effect of his former cardiac seizure; and, after death, the hypertrophy and dilatation of the heart, with the whole train of symptoms which have caused his protracted suffering and have terminated in his premature death, will be found to have arisen from disease of the valves, or from adhesion of the two layers of the pericardial membrane, the result of the former cardiac inflammation.

It is obviously, therefore, of the utmost importance, to take every precaution against the occurrence of a disease which is followed by such serious consequences. We are bound not only to employ active measures as soon as it has made its appearance, but to use every means which experience has pointed out to guard against its invasion. I will not stop to refer to the influence of particular remedies in exciting or warding off its attack, as the whole subject resolves itself into a question respecting the best treatment for the alleviation of rheumatism, and this has been fully discussed in a previous Chapter. There is one method of treatment, however, to which has been attributed such especial power in this respect, that I feel bound to make particular allusion to it. I refer to calomel, administered in repeated doses, so as to affect the mouth.

It has been asserted that, by putting the system under the influence of mercury, it is possible to ward off cardiac inflammation. No statement, however, can be more erroneous, or more mischievous: erroneous, because pericarditis is frequently set up whilst the system is fully under the influence of mercury; mischievous, because ptyalism forms a grievous addition to the miseries of the disease, very frequently causes excessive depression, and thus tends to give

an unhealthy character to the inflammatory products ; and because by its presence we are deprived of a remedy which, administered in due season, and with a proper regard to the exigences of the case, proves most valuable in promoting those actions whereby the extent of the mischief is limited, and absorption of the inflammatory products induced. Calomel, when given during the progress of inflammation in a healthy person, is assuredly one of our most powerful auxiliaries ; but when given so as to affect the constitution before the commencement of cardiac inflammation, it not only has no influence in preventing the disease, but by the irritability and general depression which it occasions, appears to modify its course in a manner by no means conducive to recovery. In five instances I have seen acute pericarditis supervene at a time when the patient was profusely salivated, and in every case the ptyalism appeared to operate prejudicially.¹ The inflammation partook but slightly of the adhesive character, the pericardium became enormously distended with fluid, absorption of this fluid was with difficulty produced, and in two of the cases death was the result. Nor is pericarditis the only complication which I have known occur, in spite of the existence of mercurial action. Endocarditis and pleurisy have also supervened at a time when the system has been under the full influence of mercury ; and in all such cases the inflammation has run its course as if no mercurial action had existed.

¹ "I have never seen more of ragged pulpy deposit on the surface of the heart from recent inflammation of its investing membrane, than in the case of a young woman, who was brought some five or six years ago into St. George's Hospital (shortly before her death), profusely salivated in sequel of rheumatic fever." ('Observations on the true Character of Acute Rheumatism,' by Dr. Wilson, Senior Physician to St. George's Hospital. 'Lancet' for 1844, vol. ii, p. 254.)

But although calomel and opium have no power of preventing the access of cardiac inflammation, those remedies which fulfil the purpose of relieving the general symptoms of the disease, are, to a great degree, safeguards for the heart: whatever is the best treatment for an uncomplicated attack of acute rheumatism, the same affords the surest guarantee against its various complications. Whether venesection, or guaiacum, or opium, be employed; or whether colchicum, calomel, alkalies, or purgatives, the heart will be protected from, or exposed to, the risk of inflammation, according as each remedy is administered judiciously. If venesection be employed in the weak and cachectic, or if, even in the strong, it be carried beyond the necessity of the case, it will surely cause irritability of the heart, and favour the extension of inflammation to it. If, on the other hand, it be omitted altogether when vascular action is excessive, when the heart is beating violently and turbulently, and secretion is defective or suspended, its omission will as certainly expose the heart to mischief, by leaving it in a state of excitement, which might have been mitigated or subdued by the aid of a moderate bloodletting. And so with every remedy which can be named. Its virtue in warding off cardiac inflammation varies according to the circumstances under which, and the judgment with which, it is employed, and coincides exactly with its virtue in alleviating the general symptoms of the disease. The treatment or the remedy which, under any given conditions of age, temperament, and severity of symptoms, is most effectual in curing the disease, the same is that which will be found most useful in preventing its extension, whether to the heart, the lungs, or any other part of the body.

Unfortunately, do what we will, we cannot *always* guard

against the access of cardiac inflammation. Oftentimes before we see our patient, inflammation of the heart or its membranes has commenced, and sometimes, even in spite of our efforts, it will supervene whilst our patient is under treatment. Therefore it becomes necessary to consider, not only how to guard against its invasion, but how to combat its symptoms when once they have commenced. For although, under such circumstances, we can seldom, if ever, do all we desire for our patient's recovery; though we can seldom or never prevent his heart sustaining *some* permanent damage, we may at least, by early and appropriate treatment, do much towards staving off the final catastrophe. We may arrest the disease in its progress of destruction; we may lessen the amount of damage inflicted; and by thus diminishing the impediments to the circulation, we may greatly defer the day, which sooner or later is certain to arrive, in which the heart, suffering from the effect of successive changes, all resulting from the primary mischief, shall no longer be able to do its work efficiently, and shall thus indirectly prove the efficient cause of asthma, dropsy, suffocation, and death.

What then, are the pathological conditions to be treated, the ends for which means are to be found? First, there is the morbid condition of the blood; the primary source of all the mischief. This obviously must be corrected as far as possible. Secondly, there is the local inflammation; and this must be subdued at all hazards, if we hope to save our patient from immediate death. Thirdly, there are the products of inflammation; and these must be got rid of, if we wish to prolong his days, and to save him from the consequences of a damaged heart. In a previous chapter¹ the

¹ Chapter V, pp. 109-116.

treatment which is best adapted to fulfil the first of these objects, has been fully pointed out; the second calls for bleeding, and calomel, and opium; and the third for blisters, diuretics, and absorbents.

Of all the remedies for the cure of rheumatic inflammation of the heart, venesection is that most generally adopted. M. Bouillaud has employed it very largely in France; and even here it has numerous and strenuous advocates. Observation, however, has not led me to form a favorable estimate of its curative power. In some few instances it has been useful in expediting the action of other remedies, and in moderating the force and frequency of the pulse when the patient has been robust, and the heart's action turbulent and excessive. But in general it has afforded very little relief.¹ It has usually failed in subduing the pain, and has produced only a temporary impression on the pulse. On the other hand, the arguments against its indiscriminate employment are numerous, practical, and weighty. It certainly is not necessary for the cure of the disease, as I have myself effected many cures without it; it is not

¹ I am glad to quote, in confirmation of my opinion, the views of those sound practical physicians, Drs. Latham, Todd, and Watson. The former remarks, "my treatment of endocarditis has not been vigorously antiphlogistic. I have seldom employed venesection at all, and never largely," yet, "it has not in a single instance proved fatal under my care;" whereas, M. Bouillaud's treatment has always been vigorously antiphlogistic; he has employed large and repeated bleedings, "in spite of which, he has had to record numerous instances, in which endocarditis terminated fatally under his management." Dr. Todd, in the same spirit, says, "my experience leads me to value very lightly the efficacy of general bleeding in inflammation of the heart;" and Dr. Watson reports, that he "seldom opens a vein in these cases."

productive of safety to the patient, for M. Bouillaud lost six out of eighteen patients attacked by the disease ; whereas, out of eighty-seven cases, of which I have notes, in which it was not employed, two only proved fatal, one of which was a case of pericarditis, which occurred in a weak debilitated person, and was complicated by low quick-spreading inflammation of the pleura. And, lastly, it is often prejudicial to the patient by exhausting his strength, rendering him liable to relapses, and altogether protracting his recovery. There also appears strong reason for doubting whether, as suggested by Dr. Watson, "bleeding to such an extent as to bring the heart's action to a pause in deliquium," may not tend to favour the deposition of fibrin upon the valvular apparatus.

General bloodletting then should be employed in rheumatic carditis, under precisely the same circumstances as in cases of acute rheumatism uncomplicated by cardiac inflammation. As a remedy to be exclusively relied upon, it is quite unavailing, and often extremely dangerous : as an expedient to be employed in aid of other remedies, it is occasionally of the greatest service. If a patient be robust and plethoric, with a pulse characterized by extreme fulness or hardness, it may be had recourse to with the greatest advantage, and may be repeated until some impression is produced on the circulation. In such persons it assists in allaying the inflammation, and favours the action of mercury and other remedies. But in ordinary cases its employment is unnecessary, and therefore inexpedient. It tends to diminish the red globules in the blood when they are already below the healthy standard, to render more irritable the already irritable and excited heart, and to favour, as I believe, the formation of fibrinous deposits on the valves. Moreover, if carried beyond the exigences of the case, it

may cause an adhesive inflammation to assume a serous or suppurative character, and may prevent that peculiar and most valuable action of mercury, whereby the extent of inflammation is limited, and its products absorbed and got rid of.

But although bleeding from the arm is seldom advisable, local bloodletting is often very serviceable. Leeches may be placed over the region of the heart, or blood may be abstracted by cupping, and thus more obvious and more immediate benefit will be obtained, and a greater impression produced on the disease as manifested by the pulse, the stethoscope, and the sensations of the patient, than by the most copious and repeated general bloodletting. Not unfrequently the præcordial pain ceases, the heart's sounds become clearer, and the pulse softer, even while the leeches are doing their work.

It is sometimes a question whether leeching or cupping is the more appropriate remedy in these cases; and some persons recommend the employment of the former, whilst others as strenuously advocate the latter. My own experience inclines me to give a decided preference to leeches. They are quite as easy of application, and are free from the objection very properly urged against cupping, of causing pressure upon the ribs at a spot where, in the inflamed condition of the heart, the least pressure and the least percussion cannot fail to be productive of mischief; and, although this difficulty may be in some measure overcome by applying the cupping glasses between the left scapula and the vertebral column, I still incline most strongly to leeches; for I have never known cupping produce the same amount of benefit that I have often seen result from leeching. Nor is it difficult to suggest an explanation of the fact. By cupping, blood is often abstracted as copiously, and almost

as rapidly, as by venesection from the arm, whereas leeches do their work more slowly, and by their gradual and continued drain tend perhaps to cause some revulsion from the deeper-seated structures. Be this as it may, they certainly afford an amount of relief out of all proportion to the quantity of blood abstracted through their agency, and incomparably greater in the majority of cases than can be obtained by venesection from the arm, or by cupping as ordinarily practised. If the force and fulness of the pulse be such as to require bloodletting for its relief, or if the patient be so plethoric as to render it desirable to let blood with the view of expediting the action of remedies, then bleeding from the arm is the most appropriate treatment. If, on the contrary, the patient be pale and weakly, and the pulse not more than ordinarily forcible, then, if bloodletting be deemed advisable for the relief of the præcordial pain and anguish, leeching, and not general bleeding, should be had recourse to. Cupping should be reserved for those cases in which a copious bleeding is required, and in which blood does not flow freely from the arm.

Mercury, like bleeding, is a valuable remedy in rheumatic carditis. Powerfully antiphlogistic in the influence it exerts, it assists in moderating the intensity, and in limiting the extent of inflammatory action; and having done so, it operates as bloodletting does not, it promotes the absorption of the matters effused. Having first of all checked the progress of the disease, it subsequently lends its aid to the process of reparation.

It is obvious, then, that no case of rheumatic carditis, occurring in a strong and healthy person, can be safely treated without mercury. It may be, and indeed is, generally unnecessary to have recourse to its antiphlogistic property so long as inflammation is confined to the joints,

inasmuch as rheumatic articular inflammation does not ordinarily tend to structural disorganization. But as soon as the heart or its membranes are implicated, the whole complexion of the case is altered. It is no longer a question, then, whether the inflammation may not be resolved without structural mischief; the mere fact of there being inflammation, implies structural changes of a grave and momentous character,—changes which must be arrested if life is to be preserved, and which, when arrested, must be modified or got rid of, if life is to be prolonged. Changes, too, they are, which occur most rapidly, and are slow and difficult of removal, so that no time must be lost in pressing to its fulfilment, the treatment considered most efficacious against their extension. For this purpose mercury, of all known remedies, is that on which most reliance can be placed. It does not supersede other remedial agents, but it comes most powerfully and beneficially to their aid. It sustains the good effect produced by bloodletting; it calms the violence, alters the character, and circumscribes the limits of the local inflammation; it stimulates the absorbents to the business of repair, and promotes the continuance of the natural secretions at a time when they are checked, and well nigh suspended by the shock the system has sustained.

But to ensure these effects the remedy must be pushed until its impression on the constitution is unequivocally declared by the occurrence of ptyalism. Three or four grains of calomel combined with opium, in sufficient quantity to prevent its running off by the bowels, may be given every four hours, and if it be considered desirable still further to hasten the access of salivation, mercurial inunction may also be had recourse to. In such a case, a drachm or a drachm and a half of the strong mercurial ointment may

be rubbed in, night and morning, on the abdomen or the inside of the thighs; or a blister may be applied to the region of the heart, and mercurial dressing applied to the blistered surface. Thus, sometimes, in the course of the second, and generally within three or four days, a full mercurial action will be produced. Then, and not until then, have we any guarantee that the medicine has found its way into the system, and that its beneficial influence will be displayed. But as soon as salivation has commenced, and even sooner in some instances, the symptoms manifestly improve; the pain and anguish begin to subside, the pulse becomes quieter and steadier, and the heart's sounds clearer. The cessation of the to and fro sound of friction in one case, or in another its recurrence coincidently with the decrease of precordial dulness, denotes the absorption of fluid from the pericardium; whilst, if there be mischief within the heart, the diminished intensity of the endocardial murmur, and the greater regularity of the heart's action, give intelligence of improvement in that quarter. These are facts to which I can testify from repeated observation, and I have so often seen all antiphlogistic remedies employed, and yet no sensible amendment produced until after ptyalism has commenced, that I cannot doubt as to the cause of the improvement.

In this, as in all other serous inflammations, it will sometimes be found difficult to obtain the constitutional effect of mercury. It may be administered freely for a considerable time, and may be guarded carefully by full doses of opium, and yet no mercurial fœtor be perceived, no evidence of mercurial action obtained. But it must not, therefore, be inferred that its exhibition is useless. As opium, when acting beneficially in delirium tremens, and acute rheumatism, may be given in enormous doses

without occasioning either stupor or constipation ; so, when the constitution is sound, and inflammation violent and extensive, mercury, whilst exercising a most beneficial influence over the course of the disease, may sometimes prove tardy in producing salivation. It seems as if, under such circumstances, its whole power were expended in allaying the diseased action ; and it fairly admits of question, whether the difficulty experienced in producing salivation, may not be taken, *cæteris paribus*, as a test of the extent and activity of the morbid action, and of the necessity for the early and active administration of mercury to control and arrest its course. Certain it is that, in my experience, the difficulty of inducing salivation has varied, *cæteris paribus*, according as the patient has been strong and healthy, the inflammatory symptoms unusually high, and the inflammation extensive, and of that peculiar character which tends to the effusion of plastic and highly organizable lymph.

Mercury, though generally beneficial in rheumatic carditis, is not equally so in all constitutions. In robust and habitually healthy persons, it seldom gives rise to much constitutional irritation or depression, and when the inflammation is extensive, it produces its specific action slowly, and acts most beneficially on the course of the disease. In such cases, therefore, it can hardly be employed too fearlessly or too vigorously. But in the weakly, the irritable, and the unhealthy, its constitutional effects often supervene rapidly, are extremely violent in their character, and, in some instances, frightfully depressing, and hence it is productive of injurious consequences by favouring a tendency to serous or suppurative, instead of to adhesive inflammation. To such, therefore, it cannot be administered too cautiously. In the one set of cases it is essential for the arrest of in-

flammation at a time when life is threatened by its extreme intensity; and the object being to produce a forcible impression on the disease as rapidly as possible, it can hardly be given too largely or pushed too vigorously. But in the other, the system is readily depressed, and when depressed, is prone to set up unhealthy inflammation.¹ Therefore, although it may be sometimes deemed expedient to obtain mercurial action in such cases, it is most desirable so to administer the remedy as that the system shall not suffer from its operation. In the first, it should be given in large doses, frequently repeated in proportion as the inflammation is active, and its progress rapid. In the last, if it be given at all, it should be exhibited in smaller doses, and at longer intervals, and at the least symptom of its action, its administration should be suspended.

Some persons have lately attempted to undervalue the curative influence of mercury in pericarditis,² and others, though not denying its efficacy in many forms of inflammation, have yet contended that the cure of pericarditis, occurring in connection with rheumatism, may be safely intrusted to other remedies.³ Now although, as already stated, I do not counsel the indiscriminate employment of

¹ This, at least, I can positively assert that, in six cases which have fallen under my observation, in which mercurial action has been accompanied by much constitutional depression, the accession of salivation has been marked by the disappearance of the to and fro sound of pericardial friction, with coincident extension of the præcordial dulness, and increase in the distance and feebleness of the heart's sounds, and that the effusion thus unequivocally declared, has been slowly and with difficulty removed.

² See some Papers published in the 'Medical Times' for 1849, by Dr. John Taylor, of Huddersfield.

³ See a Paper by Dr. J. Risdon Bennett, in the 'Lancet' for Dec. 6, 1851.

mercury, and, in some rare instances, do not administer it even in the most cautious manner, yet I cannot accord my assent to a mode of practice which would deprive us of what, in many cases, proves our most powerful ally. Other remedies very often suffice in that form of inflammation which occurs in weakly or cachectic persons; indeed, the administration of mercury is seldom of much avail in such cases, and is often prejudicial to the patient's safety, especially when the kidneys are diseased. But I am fully persuaded that, in the acute and sthenic form of pericarditis, as it presents itself in persons of a strong and healthy constitution, nothing is of greater service than the remedy in question. No such case can be treated safely without its administration. Recovery may take place, in certain instances, without it, as, indeed, without any other remedy, but that is an argument which applies to almost every disease, and to every kind of treatment, and there is no other remedy of whose curative influence experience and observation have supplied such abundant and unequivocal proofs, as of mercury in active serous inflammation. Its efficacy, however, varies very remarkably, according to the class of cases in which it is employed, as also to the mode in which it is administered, and it is not surprising, therefore, that persons who have exhibited it largely, *in all* cases of pericarditis, should have met with some in which it has been not inoperative only, but actually prejudicial to the safety of the patient. In most of such cases, the blame should not be charged upon the remedy, but upon those who have injudiciously administered it, for, given in due season and with proper regard to the exigences of the case, no remedy is more powerful, and few are so trustworthy.

Opium is, of all remedies, that which comes most power-

fully in aid of bloodletting and mercury. Roused and excited as the vascular and nervous systems are by the violence of the morbid action, and the pain which attends it, all remedies prove comparatively useless if unaccompanied by the sedative influence of this narcotic. The constant pain, with the absence of sleep, and the constitutional irritation consequent thereupon, do more, I believe, to exhaust a patient's strength, and counteract the actions essential to his recovery, than bloodletting and mercury can do to promote them. In every case, therefore, of rheumatic carditis, opium, in *full doses*, is indispensable. It should be given not only in doses adequate to restrain the purgative action of the calomel, but in quantity sufficient to assuage the pain and allay the irritability. From two thirds of a grain to a grain, or even more, should be prescribed, in the form of a pill, in combination with calomel, every three or four hours; and in the intervals, if there be much pain, it is expedient to administer eight or ten minims of the tincture, or of Battley's sedative solution.¹ To the weak and irritable, to whom mercury is of little service, it proves peculiarly valuable. It not only subdues pain, but it allays irritability and procures sleep, and I am satisfied that many of my patients would have fallen victims to the disease, had not their strength been husbanded by its sedative influence.

It is probable, however, that opium exercises some more directly curative influence. In these cases of pericarditis, the two inflamed surfaces are in constant motion and rub against one another; their innervation is exaggerated, their irritability exalted. Now, although opium cannot, of

¹ I find that in these cases, Opium itself is usually preferable to the Salts of Morphia.

itself, prevent the continuance of this friction, it can blunt the sensibility of the inflamed membrane, and make it less obnoxious to the effect of irritation. Just, as before cardiac inflammation has been set up, opium may exercise a sedative influence on the heart, and thus may render it less prone to be affected by the irritation of the rheumatic poison, so, also, I believe, after the commencement of mischief, opium may subdue and tranquillize, and thus prevent that excess of irritation whereby the course of inflammation is prolonged, and its products made to assume an unhealthy character. In several instances of pericarditis in which, in spite of venesection and mercury, inflammation has continued unabated, whilst the constitutional irritability has been excessive, and the heart's action rapid and violent, I have seen the mercury omitted and opium administered alone, with the happiest and most speedy results. The pain has ceased, the patient has obtained sleep, his irritability has subsided, the pulse has fallen in frequency, and has increased in steadiness, and the stethoscope, no less than the general symptoms of the disease, has testified to the reality of the improvement. The same train of symptoms was also observed in two cases in which, from the weak and cachectic condition of the patients, I was fearful of inducing mercurial action, and therefore trusted exclusively to full doses of opium with alkalies, diuretics, and repeated blistering. The sedative apparently contributed as much to the patients' recovery, as it manifestly did to their comfort.

Another most important remedy in rheumatic pericarditis is a large blister applied to the chest. In the early stage of the attack, especially in the young and vigorous, I am more inclined to confide in leeches; but when once effusion has taken place, blistering is of all local remedies

the most serviceable. Indeed its efficacy appears to vary, in some measure, according to the amount of liquid effusion, its virtue being most unequivocally displayed when the amount of fluid is greatest. In such cases an immediate diminution in the precordial dulness, together with greater clearness in the heart's sounds, is often observed as the result of a large and efficient blister.

Whilst applying leeches and blisters, and in some instances pushing mercury to salivation, the other general indications must not be lost sight of. Though pericarditis or endocarditis be present, they are still rheumatic, due to the same cause, and requiring the same general treatment for their relief, as does the articular inflammation. Alkalies, diuretics, and colchicum are still necessary to counteract and get rid of the *materies morbi* to which all the mischief owes its origin, and without the removal of which it is difficult to conceive that a cure can be effected. Not only are they conducive to the elimination of the rheumatic virus, they also afford most powerful aid to blisters and mercury, in removing the fluid products of inflammation. They first assist in counteracting and getting rid of the cause of the disease, and then in repairing the mischief it has occasioned. In endocarditis more especially, alkalies and the neutral salts, more particularly the salts of ammonia,¹ prove eminently useful; for, by helping to maintain the solubility of the fibrin, and so preventing its deposition on the valves, they guard against a lesion which, by the consecutive changes to which it gives rise, leads surely and rapidly to an untimely death.

In all cases, without exception, rest and abstinence are of the utmost importance. No treatment can be satisfactory in its issue, unless perfect rest be enjoined, and every cause of excitement carefully guarded against. This has

¹ See Dr. Richardson's 'Astley Cooper Prize Essay,' for 1856.

been repeatedly forced upon my attention in the strongest possible manner. In several instances in which patients have worked themselves into a state of excitement, in consequence of the dread inspired by the thoughts of being leeches, or cupped, or bled, every symptom has been aggravated, in spite of the remedies employed. Indeed, so strikingly was this the case in one instance, that I was obliged to omit all local treatment, and to trust entirely to mercurials and diuretics, with opium in full and repeated doses.

One other point still remains for consideration—What symptoms are sufficient to warrant such a presumption of the existence of cardiac inflammation as to justify the commencement of active treatment?

This question hardly admits of a definite answer, inasmuch as the symptoms which mark the accession of carditis are of a complex nature, and, moreover, are uncertain and variable in their existence. In most instances some exocardial friction-sound is heard, or an endocardial murmur accompanying the heart's sounds; and, together with this, there is anxiety of countenance, and præcordial pain and anguish, with dyspnœa, palpitation, and irregularity in the heart's action. In such cases there can be little doubt as to the existence of inflammation, and no hesitation, therefore, as to the course to be pursued. The same holds good whenever the physical signs of inflammation are present, even though some of the general signs be wanting. In other instances, however, our attention may be called to the sudden accession of præcordial pain occurring coincidently with turbulence, or fluttering, or irregularity of the heart's action; and yet, on examining the heart most carefully, we may fail in detecting the slightest physical indication of existing mischief. What is to be done in such a dilemma?

Are we to trust implicitly in the general symptoms, which are on all hands admitted to be uncertain and fallacious, or are we to delay taking active measures until the presence of inflammation has been rendered indubitable by the presence of the auscultatory signs? The cautious practitioner will not allow himself to be unduly biassed in one direction or the other. The general symptoms must not be relied upon too implicitly, neither must the absence of inflammation be inferred, simply because as yet there is no murmur nor roughness with the sounds of the heart. Occasionally a murmur does not arise until inflammation has made some progress, and we are bound, therefore, to commence our treatment before this symptom is developed. Indeed, the frequent occurrence of cardiac inflammation gives such a significance to præcordial pain, dyspnœa, and palpitation, occurring in the course of acute rheumatism, that even if, on listening most carefully to the heart, we are unable to detect the least change in its rhythm, the least prolongation or roughness of its sounds, or the slightest evidence of pericardial friction, we are still bound to take such precautions as the circumstances of the case may seem to call for. Though we may not feel justified, without some direct evidence of inflammation, in having recourse to active depletion, we shall yet do well to put a few leeches on the chest, and commence the cautious administration of mercury, whilst watching most jealously for any indication which can fix the seat and nature of the disease, and warrant our taking more active measures.

When the pericardium is affected, there is sometimes, from the first, a distinct sound of friction, and then, however slight the sound may be, the evidence of mischief is unequivocal, even though there be total absence of pain and other general symptoms of cardiac inflammation. But

it frequently happens that the sound occasioned by exocardial friction is at first indistinct, heard only over a small circumscribed space in the præcordial region, and audible at one moment, inaudible at another. Thus, sometimes for a day or two together, this abnormal sound will be alternately audible or inaudible, until at length it either becomes permanent or ceases altogether. In cases such as this, it would not be right to defer all treatment until after the full development of a friction-sound, neither would it be expedient to adopt the active measures required for the arrest of wide-spreading inflammation. These indistinct and indefinite yet abnormal sounds, so frequently subside without any treatment, that their presence alone does not justify our taking any vigorous steps for their removal; at the same time they are so suggestive of evil, and so commonly prove the precursors of extensive mischief, that some precautionary treatment should be adopted, and their course narrowly watched, in order that the remedies may be pushed more vigorously should their increase betoken active inflammation.

So, again, with regard to endocardial disease. When a murmur, known not to have existed before, arises in the course of acute rheumatism, and when, more especially, its commencement is marked by præcordial pain, by increase in the febrile disturbance, and by fluttering or irregularity in the heart's action, then it is to be referred to commencing endocardial mischief, and no time should be lost in employing the full force of our remedial agents.

Sometimes, however, no distinct murmur exists, but we may distinguish a slight roughness or harshness, or undue prolongation of the systolic sound. Even this, if accompanied by præcordial pain, dyspnœa, and palpitation, is sufficient to excite alarm, and to justify the adoption of

measures for its subjugation, inasmuch as such a symptom affords sure evidence of mischief, and is the usual forerunner of active inflammation. The harsh, or rough, or prolonged sound of to-day, is the precursor of the systolic murmur of the morrow.

At other times old-standing valvular disease, with its consequent old-standing valvular murmur, makes it difficult, if not impossible, to determine by the ear alone, whether any fresh inflammation has been set up. In such a case the activity of the treatment must be regulated, in great measure, by the severity of the general symptoms.

Not unfrequently a systolic murmur arises which, from its position and the direction in which it is heard, is manifestly connected with imperfect closure of the mitral orifice, yet is unaccompanied by præcordial pain, dyspnoea, or palpitation, or by any formidable cardiac symptoms. In many such instances the irregular character and short persistence of such a murmur, its frequent recurrence, and its ultimate subsidence without any treatment specially directed to its subjugation, has led me to believe it referable to temporary imperfection of the valvular apparatus consequent on the irregular contraction of the structures connected with the valves. Therefore, although from the first commencement of such a murmur, it is always expedient to have recourse to precautionary treatment, such as the administration of calomel and opium, it would hardly be right to bring the full force of antiphlogistic remedies to bear, unless the murmur persists or increases in intensity, or is accompanied by pain, irregularity of the heart's action, or by some other indication of organic cardiac mischief.

Sometimes, again, as I can testify from repeated observation, an endocardial murmur arises, in no way connected with inflammatory action, but referable altogether

to functional causes; and although the superficial position of such a murmur, and the direction in which it is heard, viz., along the track of the pulmonary artery, when coupled with the pale exsanguine appearance, and exhausted condition of the patient, serve, in most cases, to distinguish it from a murmur attributable to organic mischief, still, if considerable caution be not observed, it may be mistaken for a murmur the result of inflammation, and treatment may be adopted ill-suited to the circumstances of the case.

The greatest care, then, is requisite in listening to the cardiac sounds. The heart should be examined daily, and the least deviation from health noted. The slightest prolongation, or unnatural harshness, or roughness of its sounds, is sufficient to excite alarm, and the least suspicion of inflammation is enough to justify some precautionary treatment. But until the existence of inflammation is placed beyond doubt, it is not necessary, nor indeed would it be prudent, to push our measures so vigorously as otherwise would be deemed essential. The remedies to be employed are the remedies for inflammation, but they should be duly apportioned to the exigences of the case.

There is yet one point which requires notice in connection with these endocardial murmurs. It is, that during the convalescence of a patient, even after he has risen from his bed, and has begun to walk about the room, a valvular murmur will sometimes make its appearance, and, unless immediately attended to, will remain permanent. In these instances the murmur itself affords the first intelligence of mischief; for, although there generally exists some irritability about the heart, there is no pain, and no unusual palpitation. Even during convalescence, then, the heart

must be constantly and carefully examined, and on the first indication of change in the character of its sounds, most active treatment must be had recourse to; treatment active not in its essential characters so much as in the rapidity with which it is pushed. In these cases there probably exists some chronic irritation of the valves, and when the rapidity of the circulation is subsiding, fibrin is deposited just as it often is in the rheumatic diathesis, independently of any paroxysm of acute rheumatism, and just as it was seen to be with the gradual cessation of the circulation in Dr. Hope's experiments on the ass. The remedies most powerful in preventing its further deposition, and in effecting its removal, are alkalies and the neutral salts, with opium, in full doses, and mercury, cautiously administered.

In every instance in which, after all active symptoms have subsided, there still remains much irritability of the heart, it is expedient, whilst attending to the general health, to administer occasional doses of opium and digitalis, and to apply an opium or a belladonna plaister to the chest. By such precautionary measures, and by enforcing that rest which is necessary to enable the excited heart to recover itself and reassume its natural mode of action, we may guard, in great measure, against those lesions which, arising after all inflammatory action has been subdued, are due to the existence of chronic irritation rather than of true inflammation.

The following cases will serve as illustrations of the treatment recommended, and of the share which each remedy takes in effecting the cure.

*Case 1.*¹—Fanny Nicholls, a pale-faced girl, æt. 19, was

¹ This is the only case in which I have ever known extensive peri-

admitted into the Queen's Ward of St. George's Hospital, on the 31st of December, 1850. She had been attacked, on Christmas Day, with redness and swelling of the joints and all the usual symptoms of rheumatic fever. On admission into the hospital these symptoms continued with increased severity. The sounds of the heart were clear; but as she complained of pain in the præcordial region it was judged expedient to put her under the influence of mercury, and the following pill was therefore ordered :

R. Hydrargyri Chloridi, gr. iij; Opii, gr. j. M. ft. Pilula 6^{ti}
horis sumenda.

January 1st.—The next day the sounds of the heart still remained clear, and there was no increased dulness on percussion in the præcordial region, but she complained, as before, of pain in the chest, and the pulse was 120 and stronger; so it was judged advisable *to repeat the pill every four hours*, and to give her a saline effervescing draught with gr. xv of Nitrate of Potash.

So she went on until the 4th instant. Day by day her heart was carefully examined, but on no occasion could any evidence of mischief be obtained. My friend and colleague, Dr. Bence Jones, under whose treatment she had been placed, was now called away from town, and she was transferred to my care. Early in the morning her chest had been examined, and the heart's sounds reported free from murmur; but when I first saw her in the afternoon she was complaining of increased pain in the cardiac region, and an incipient exocardial friction

carditis subdued and the friction sound got rid of, within six days from the date of its commencement. Such a speedy termination of the disease cannot usually be brought about even by the most judicious treatment.

sound was audible at the base of the heart, and a slight systolic murmur at the apex. There was, as yet, no extension of the natural præcordial dulness. Her joints were still red and swollen; the gums were unaffected by the mercury. Pulse 120, full, and somewhat irregular, skin perspiring freely, tongue furred, and bowels confined. Urine reported scanty and turbid, but none had been saved for examination. The inflamed joints were wrapped up in flannels soaked in an alkaline and opiate fomentation, and as she did not appear to be very susceptible of the influence of mercury, I ordered a drachm of the Mercurial ointment to be rubbed in night and morning, on the chest, and the Calomel and Opium pill to be repeated every four hours, as before. The following draught was also ordered to be taken between each dose of the pills :

R. Haust. Salinus effervescens c. Potassæ Nitratis, gr. xv ;
Sodæ Potassio-Tart., ʒij ;
Tincturæ Opii, ℥x.

On the 5th she remained much the same. The sound of friction was not so loud as on the preceding day, but it had become universally diffused over the heart, and there was increasing dulness in the præcordial region, showing the existence of effusion in the pericardium. As the gums were not affected by the mercury the medicines were continued as before.

On the 6th she was better in some respects. She had slept a little during the night; her pulse had fallen to 104; the urine, though still extremely acid and turbid, was more abundant, and her joints were far less painful. Nevertheless, the exocardial friction sound was very loud, and the præcordial dulness more extended; so a large blister was ordered to be placed over the heart; the Calomel and the Mercurial inunction were continued as before, and ten

minims of the *Vinum Colchici* were added to the draught. This I thought likely to prove serviceable from its diuretic no less than from its anti-rheumatic properties.

On the 7th there was very little alteration in her symptoms, except that the urine had become abundant and almost clear, sp. gr. 1026, and the bowels showed a tendency to relaxation. The blister had risen well and was discharging freely. The gums were still unaffected by the mercury, but as the bowels were becoming irritable the inunction was discontinued, and fifteen minims of the *Tr. Opii* were given with each dose of the medicine. The pills were repeated as before.

On the 8th there was manifest improvement. She had slept about two hours during the night; her pulse had fallen to 80, and the urine continued clear, abundant, sp. gr. 1025. The blister was still discharging freely; there was less extended dulness in the region of the heart, and the friction sound, though still loud at the base of the heart, was no longer audible at the apex. There was still a slight tendency to diarrhœa, but as the gums were unaffected, the pills and the draught were continued as before.

On the 9th the favorable progress of the disease was more marked. The dulness on percussion in the præcordial region was now scarcely more extended than natural, and the friction sound was confined to the base of the heart. The systolic bellows-sound had quite disappeared. The relaxation of the bowels still continued, though not to a distressing extent; so, as the mouth was as yet unaffected by the mercury, the pills and draught were repeated.

On the 10th the inflammation of the heart was subdued. There was no longer any extension of the præcordial dulness, and no longer any friction sound or endocardial

murmur. The pulse was 84, soft; the urine clear and abundant, and the tongue much cleaner. There was neither redness nor tenderness of the gums, but the relaxation of the bowels had increased, and the diarrhœa was evidently due to mercurial action, so I ordered her to omit the pills. The draught was continued as before, and a pill was given at bedtime, containing three grains of Calomel and two of Opium.

On the 11th, the diarrhœa still continuing, the dose of Potassio-Tartrate of Soda was reduced to a drachm; and on the 13th, as her aspect was greatly improved, the pulse quiet, the tongue moist and almost clean, the salines were omitted, and a quinine draught was administered twice a day, whilst her bowels were quieted by Dover's powder. From this time her convalescence proceeded steadily; and when she left the house, on the 5th of February, her heart was acting regularly and its sounds were clear and free from murmur.

Case II.—*Sarah Cowley*, æt. 23, was admitted into the Rosebery Ward of St. George's Hospital on the 8th of August, 1851, labouring under acute rheumatism of nine days' duration. She had undergone an acute attack of the disease four years ago, but from that time had remained free from pain until the commencement of the present illness. On admission, her left hand, right knee, and ankle were exquisitely painful, and were red, swollen, and inflamed; skin hot, but not perspiring; tongue yellowish, furred, and somewhat dry; bowels open; urine scanty and strong smelling, high coloured, and loaded with the lithates, sp. gr. 1020; saliva acid. The menstrual periods were reported regular. Her countenance was anxious; the

breathing short and catching; and she complained of much pain in the region of the heart. Not the slightest evidence of exocardial friction could be detected; but a loud, harsh murmur, heard loudest at the apex of the heart, accompanied and almost overpowered the first sound of the heart. The pulse was 100, somewhat hard and irregular.

The inflamed joints were fomented as usual, and the following remedies were prescribed:

Hirudines x, regioni cordis.

R. Hydr. Chloridi, gr. iij; Opii, gr. j. M. ft. Pilula, 4^{ta} quâque horâ sumenda.

Haustûs Potassæ Nitratis, ʒjss; Sodæ Potassio-Tart., ʒij;
Vini Colchici, ʒxv; Tinct. Opii, ʒviiij.

M. ft. Haustus 4^{ta} horis alternis sumendus.

Fever diet.

9th.—She dozed at intervals during the night, and perspired freely. The next day the joints were much easier, and the urine more abundant; sp. gr. 1028. The heart's sounds, however, were much the same, and there was still some pain at the heart. The pulse was 100, the tongue coated, and somewhat dry, and the bowels rather relaxed.

Rep. Hirudines vj, regioni cordis.

Repetatur Pilula 4^{ta} horis.

Rep. Haustus 4^{ta} horis alternis, sed c. Tincturæ Opii, ʒxv.

10th.—Dozed at intervals throughout the night, and is much better this morning. Has no longer any redness or swelling of the joints, or any pain in the chest except after exertion, as from turning in bed. Systolic murmur still present, but less loud and harsh. Perspires freely. Pupils rather contracted. Tongue coated. Bowels much relaxed. No urine had been saved for examination, but it was reported free and no longer turbid. Gums not affected.

As the force of the disease was evidently checked, and the opium, though given in sufficient quantity to cause contraction of the pupils, had failed to restrain the purgative action of the mercury, and to allay the irritation to which it gave rise, the pills were repeated only twice a day. The draught was continued as before.

11th.—She passed a better night, and the next day reported herself almost free from pain. She was perspiring freely. Gums becoming red, swollen, and tender. Bowels much relaxed. No urine saved for examination, but reported abundant and clear. Pulse 116, weak and irritable. A systolic murmur still perceptible, though less loud and harsh than it was yesterday.

As the rheumatic symptoms were now almost subdued, the pills and draught were omitted, and a grain of opium was given every six hours. The next day—

12th.—As the skin was becoming sodden, a quinine draught, with a few minims of the dilute Sulphuric Acid, was ordered to be taken twice a day; and, as the bowels had not been relieved, ʒss of the Sulphate of Magnesia was added. At the same time, by way of precaution against a relapse, a pill was given at night, containing a grain of Opium and 2 grains of the acetous extract of Colchicum.

From this time she improved daily. By the 14th she had no longer any pain, the heart's action was much quieter, and the murmur softer. On the 16th she was so much more tranquil, and all her symptoms showed such decided improvement, that I deemed it unnecessary to continue the pill, and therefore ordered her to take the quinine draught only. By the 18th the murmur had become so faint, that at times the ear almost failed to appreciate it, and in other respects she was convalescent. However, as she was very pale, five grains of the Pilula Ferri co. were given three times

a day, in addition to the quinine; and this she continued taking up to the 3d of September, when she left the house, her health being completely re-established. A slight systolic mitral murmur, however, still existed.

Case III.—*Harriet Pope*, a pasty-faced girl, æt. 17, was admitted into the Princess Ward of St. George's Hospital on the 3d of September, 1851, suffering from acute rheumatism. The present was her first attack. It began five days before admission, with pain, heat, redness, and swelling of the feet, ankles, and the left knee; but when I first saw her in the hospital, the feet and ankles alone were affected. She was perspiring freely; tongue coated and white; urine acid, high coloured, and rather scanty, sp. gr. 1014; bowels reported open; pulse 130, weak but regular. She had no pain in the region of the heart, nor was there any extension of the præcordial dulness; but there was a slight roughness with the first sound at the apex of the heart, and an indistinct irregular double murmur, which gave the idea of a commencing exocardial friction sound at the base of the heart.

I ordered eight leeches to be applied to the region of the heart, the inflamed joints to be fomented as usual, and prescribed the following:

R. Hydrargyri Chloridi, gr. iij; Opii, gr. j, ter in die.
Haustus Sennæ c. Sodæ Potassio-Tart., ʒiv, cras mane.
Haust. Potassæ Citratis, ʒiss;
Sodæ Potassio-Tartratis, ʒij;
Vini Colchici, ʒxv;
Liq. Opii Sed. (Battlei), ʒviij; 6th quâque horâ.

Sept 4th.—'The next day she was decidedly worse. The

pains in the joints were easier, but she had not slept ; her countenance was anxious, the pulse 140, extremely weak, irregular, and occasionally intermittent, and she exhibited extreme disinclination to change her posture. There was still no pain at the heart, but extended dulness on percussion in the præcordial region, with great obscurity and distance of the heart's sounds, showed that effusion into the pericardium had taken place with unusual rapidity. A distinct exocardial friction sound could be heard now and then at the base of the heart. The bowels had acted twice after the Senna ; the tongue was furred, but moist. No urine had been saved for examination ; it was reported scanty.

Hirudines xij, regioni cordis et postea emplastrum Cantharidis.

Repetatur pilula 6^{tis} horis.

Repetatur haustus 6^{tis} horis alternis.

5th.—The next day there were signs of amendment. She had slept fairly ; the pains in the joints were slight, and the swelling had entirely disappeared ; the pulse had fallen to 120, and was much more regular ; the præcordial dulness was less extended ; the sounds of the heart were less distant, showing absorption of the fluid in the pericardium ; and a loud to and fro sound of friction was now audible over the entire surface of the heart. The countenance, however, was still distressed and anxious. She was perspiring freely. The urine was reported to have been passed in much larger quantity : a small quantity which had been saved had a sp. gr. of 1028.

Repetantur Medicamenta.

6th.—She passed a restless night, and the next day ex-

hibited more anxiety of countenance, and in many respects a material aggravation of her symptoms. She now, for the first time, complained of pain at the heart, and of dyspnœa, with occasional cough; there was sonorous rhonchus all over the chest; the heart's sounds were again more obscured; the præcordial dulness had again extended itself; and the pulse was 120, and irregular. The skin was hot and perspiring; but the discharge from the blister had almost ceased.

Repetatur emplastrum Cantharidis regioni cordis.

Perstet in usu Medicamentorum.

7th.—The following day the pain at the heart continued, and the increase of effusion was manifested by the total cessation of the friction sound, by the distance and feebleness of the heart's sounds, which had become almost inaudible, and by the dulness on percussion which now extended over to the right side of the sternum. Her countenance was very anxious; the pulse, however, had fallen to 100, and, though feeble, was tolerably steady; the bowels had acted once comfortably; and she had no longer any pains in the joints. No urine had been saved, but it was reported tolerably abundant. The gums were not affected, so mercurial ointment was applied to the blistered surface, the pill was repeated every six hours, as before, and a diuretic draught, containing Potassæ Nitratis, gr. x, Tr. Scillæ, ℥xv, Tr. Cantharidis ℥xx, was substituted for the saline medicine she had hitherto taken.

8th.—The next day mercurial action was more decided, and she was manifestly better. Her countenance was less anxious; the extent of dulness on percussion had diminished, the friction sound was again audible, the sounds of

the heart were loud, and the pulse had fallen to 96. The bowels were somewhat relaxed.

Perstet in usu haustûs diuretici.

Repetatur pilula bis in die tantum.

Opii, gr. j, horâ somni.

9th.—Continued improvement. Gums fully affected. Sounds of the heart clearer, and friction sound very loud. Less extension of the natural præcordial dulness. Pulse 90, regular. Bowels much relaxed, with green mercurial motions.

Perstet in usu haustûs diuretici.

Omittantur pilulæ.

Opii, gr. j, bis in die.

From this time her improvement was steady and progressive. On the 12th I thought it expedient to apply another blister on the chest, with the view of accelerating the absorption of the matters effused into the pericardium, but with this exception, no alteration was made in the treatment until the 4th of October, when, as the endocardial murmur was no longer audible, and the pulse was weak, a drachm of the Tinct. Cinchonæ was added to the draught. When she was able to move easily in bed and shift her position, so as to submit to a careful stethoscopic examination, some little dulness was discovered at the base of the right lung posteriorly, and ægophony was also audible there; but as there was no pain on inspiration, no distress of breathing, and no quickness or sharpness of the pulse indicating existing inflammation, no treatment was specially directed to it, but the diuretic mixture was continued as before. By the 9th of October the ægophony had disappeared, healthy respiration was re-established throughout the chest, and the heart's sounds were clear and free from

murmur, so the diuretics were omitted, and a quinine draught ordered. This she continued taking until the 21st instant, when she left the hospital ; the heart's action being regular, its sounds perfectly free from murmur, and the respiration natural.

Case IV.—On the 19th of January, 1847, I was asked to see Master F. O—, æt. 8, who had been seized that morning by acute pain in the right elbow and the left shoulder, and on the left side of the chest. The pain attacked him suddenly, without rigors or any previous warning. He was unable to bend his right arm, or to raise the left arm to his head, and could not bear pressure on either of the affected joints or on the pectoralis major. Skin hot and perspiring. Tongue furred. Bowels costive. Urine loaded. Pulse 130, rather sharp. Heart's sounds free from murmur. Perspiration free. Five grains of Calomel, followed by a black draught, aided by some saline medicine, with ten grains of Nitre, fifteen minims of Colchicum Wine, and fifteen minims of the Vinum Antimoniale, got rid of the pains within twenty four hours, and I saw nothing more of him until the 24th, when I was again asked to see him. He was then complaining of faintness, with palpitation and a stabbing pain under the left breast. This pain was increased by pressure under the ribs on the left side, as also by the effort of coughing. There was no pleuritic friction nor ægophony, nor were there any of the fine crepitations of pneumonia, but a loud to and fro sound of friction was audible over the whole of the cardiac region. There were now no pains in the limbs. Skin hot and perspiring, the perspiration having the peculiarly sour odour of rheumatism. Tongue very furred. Bowels open. Urine turbid and scanty. Pulse 120, sharp, irregular, and occasionally intermittent.

Eight leeches were placed at once over the heart, and

were followed by a large blister; and the following medicine was prescribed:

R. Hydrargyri Chloridi, gr. iij;
 Opii, gr. ss. M. ft. Pilula 4th horis sumenda.
 Haustûs Salini ex Ammoniâ, 3jss;
 Potassæ Nitratis, gr. x;
 Potassæ Tartratis, 3ss;
 Vini Colchici, ℥viij. M. ft. Haustus 4th horis alternis
 sumendus.

25th.—Dozed during the night, and is much as he was yesterday. The blister rose well, but the friction sound has ceased, the heart's sounds have become feeble, distant, and muffled, and there is extended dulness on percussion in the cardiac region. Evinces a tendency to faint.

Repetantur pilulæ et haustus 4th horis.
 Unguentum Hydrargyri parti vesicatæ.

26th.—No return of friction sound. Further extension of præcordial dulness. Is very irritable. In other respects much as yesterday. No mercurial action.

Repetantur medicamenta 4th quâque horâ.
 Rep. emplast. Cantharidis regioni cordis.
 R. Pulv. Ipecacuanhæ co., gr. v, horâ somni.

27th.—Slept fairly. The blister rose well, and to-day there is considerable improvement. Less extended dulness in the præcordial region. Friction sound again audible over the whole extent of the heart, and the sounds of the heart much louder.

Repetatur pilula sextis horis.
 Perstet in usu haustûs, sed adde Tr. Scillæ, ℥xl, Tr. Cantharidis,
 ℥xx.

During the next four days a gradual improvement was perceptible; the heart's sounds became clearer and louder;

the dulness on percussion decreased; the urine increased in quantity, and the tendency to faintness ceased; the friction sound, however, continued, and was heard over the whole heart, and the system gave no token of being affected by the mercury.

On the 1st of February, contrary to my express injunctions, he had been allowed to see and talk to some of his friends, sit up in bed, and otherwise exert himself, and when I visited him in the evening his symptoms were materially aggravated. The pulse, which for the last five days had averaged 100, had again risen to 130; the heart's sounds were less clear, and the dulness in the mammary region had increased. There was as yet no evidence of mercurial action, so the pills and draughts were repeated every six hours, as before, and another blister was applied to the chest. The bowels being somewhat confined, a senna draught was administered.

The beneficial influence of the blister was soon displayed, in the increased steadiness of the heart's action, and the clearness of its sounds; and, by the 5th, the symptoms were much the same as before his relapse. The friction sound was very loud, and the præcordial dulness had greatly diminished. About this time I had the benefit of a consultation with Dr. Watson, and, as there was still no mercurial action, it was decided that the pills and draughts were to be continued as before. He now slept well, and passed large quantities of urine, and day by day his symptoms betokened gradual amendment. The heart's sounds became clearer, and the friction sound less intense. The gums were slightly swollen, and rather more red than natural, but there was no mercurial fetor, no increased flow of saliva, and no evidence of full mercurial action.

By the 11th the friction sound had disappeared, so the

pills were omitted. On the following day, as the improvement was fully maintained, a draught was ordered to be taken twice a day, containing half a drachm of Nitric Ether, eight grains of Nitrate of Potash, and an ounce of the infusion of Cascarilla; and, as the action of the heart was still turbulent, a belladonna plaister was applied to the chest, and a pill given every night at bedtime, containing half a grain of powdered digitalis, a quarter of a grain of opium, a grain of powdered squills, and two grains of blue pill. Under this treatment he improved rapidly, and on the 20th it was judged safe to omit the medicines he had been taking, and to give him a quinine mixture, perfect rest being strictly enforced. He continued to take the tonic until the 28th, when, as the heart's action was regular and tranquil, and his appetite good, the medicine was discontinued.

I have seen him occasionally, during the holidays, ever since this attack, and the heart's sounds remain clear, and its action regular. Its impulse is somewhat stronger than natural, but I cannot perceive that there has been any material increase in this respect during the last seven years. As yet there has not been the slightest recurrence of rheumatic symptoms.

CHAPTER IX.

ON THE STATISTICS OF HEART DISEASE IN CONNECTION WITH RHEUMATISM.

THE statistics of heart disease in connection with rheumatism form a subject deserving of attentive study, not only on account of their practical importance to the physician who is called upon to prognosticate as to the favorable or unfavorable issue of his patient's malady, but as tending to elucidate several important matters on which much loose speculation has been hazarded. That inflammation of the heart, or, as it is commonly designated, "rheumatism of the heart," is a *frequent accompaniment* of rheumatic disease, and forms a *fearful addition* to articular pain and inflammation, has, alas! been fully verified by thousands who, sooner or later, have fallen victims to its ravages. But the probability of its occurrence in any particular instance, the age and sex of its victims, the form of rheumatism in which, and the stage of the disease at which, its invasion is most to be dreaded, the relative frequency of the different forms which it assumes, and the effect of remedies in warding off its attacks,—these are points on which the number of observations hitherto recorded are insufficient to warrant our speaking with certainty. Dr. Latham, Dr. Taylor, and other inquirers, have done much towards clearing up existing doubts on *some* of these matters, but no one can

feel satisfied on a subject of so much importance until their results have been verified by further investigation.

Much difficulty has occurred to me, in instituting a comparison between the result of my experience at St. George's Hospital and that which others have put on record, from the fact that a wide difference exists between the grounds which have been chosen as the foundation of the various calculations. Some persons, for instance, in dividing febrile rheumatism into an acute and a sub-acute class, have included many cases in the former, which others would have placed in the latter; and some have arranged in their sub-acute class many cases which others would have denominated chronic. Some have been guided in their classification solely by the intensity of the articular inflammation; some by the severity of the febrile paroxysms; whilst others, taking the mixed indication afforded by the fever and the articular pain and inflammation, have arranged and classified their cases accordingly. Hence one fertile source of uncertainty and confusion. Judging from my observation of the nomenclature adopted at several of our larger public institutions, I believe that cases are often termed "acute," which I should denominate "sub-acute;" I have therefore discriminated, in separate tables, between the undoubtedly acute cases, and those which, as marked by less violent symptoms, may be regarded as instances of less active disease.¹

¹ Under the head of *Acute Rheumatism*, I have classed all cases in which the febrile paroxysm has been "acute," and accompanied by the profuse acid perspirations, which are eminently characteristic of the acute disease; whilst under the head of "sub acute," I have arranged all cases in which the fever has assumed a milder form, and the articular symptoms have been less acute, though marked, perhaps, by pain, and redness, and swelling. Cases which have not been

Another productive source of error is the great variation in the mode in which the different classes of cases have been grouped for the purpose of examination. Nothing can be more certain than that the frequency of heart disease varies greatly, according to the type and severity of the rheumatic affection; and the proportion of cases in which heart disease is met with, must vary therefore according as the conclusions of different observers have been drawn from acute or sub-acute cases, or from both classes of cases taken conjointly. In some instances on record, it is stated that the conclusions have been arrived at from the examination of acute and sub-acute cases taken indiscriminately: in others, it is impossible to ascertain with certainty the precise nature of the cases from which the recorded results have been obtained. The numbers, however, agree so closely in some instances with those obtained from acute and sub-acute cases taken con-

attended by a well-marked febrile movement, even though accompanied by œdematous fulness about the joint, or by slight effusion within the capsule, I have placed under the head of "chronic." In making this division, I have allowed myself to be guided by the amount of the fever, rather than by the severity of the articular inflammation, under the belief, that the fever and the arthritis, carditis, pneumonia, pleurisy, and other local symptoms which often accompany the acute form of rheumatism, are the results of one common cause, and that the fever affords a more certain indication of the amount of poison present in the system, than does the arthritis, which experience has shown to be sometimes absent, even when the fever is very severe, and attended by acute inflammation of the heart. Moreover, the conviction has been forced upon me, that the extent and number of the internal complications bear a more constant relation to the amount of febrile movement than to the number and intensity of the articular inflammations, and that the *fever* is a fair exponent of the probability of secondary affections in Rheumatism, just as Louis has shown it to be in typhoid fever, and many other acute disorders.

jointly, that I cannot help thinking they must have been deduced from a class of cases in which the sub-acute were included with the more acute examples of the disease. Indeed, I hope to show that the differences existing in the very foundation of all the subsequent calculations account for most of the discrepancies which exist between the reports of various observers.

The cases from which my inferences are drawn are 379 in number. They embrace all the examples of acute and sub-acute rheumatism which were admitted into St. George's Hospital under the care of the physicians, during the time I held the office of medical registrar, namely, between the 1st of January, 1845, and the 1st of May, 1848, and include 246 examples of the disease in its more acute form, and 133 of a milder character. The heart was healthy in 160 instances; in 32 I have no note of its condition, and probably, therefore, it was healthy; and in 187 it was either temporarily or permanently deranged to a greater or less extent. Three tables, exhibiting an analysis of these cases, are appended to this chapter.¹

Of the 187 cases of heart disease, 130 were examples of recent mischief,² as was evidenced, either by the supervention

¹ See pp. 280-84.

² It must not be understood, that in all these cases, the heart was previously free from disease, neither must it be inferred that the endocardial murmur which existed, was invariably referable to organic mischief. These are points on which *positive* information cannot usually be obtained. I only wish to imply, that in 130 instances, the heart was implicated to a greater or less extent during the then existing attack of rheumatism, as was indicated by a temporary or permanent exocardial or endocardial murmur. In seventeen cases the prior existence of heart affection was clearly ascertained, and in several others was strongly suspected, and in some, doubtless, the existence of a valvular murmur was attributable altogether to func-

of a murmur, *after* the patient's admission into the hospital, or by the existence of a murmur which, though present at the date of the patient's admission, was found to subside towards the close of the disease, or was coincident with præcordial pain and anguish, or with temporary irregularity in the heart's rhythm; in 18 the date of the mischief was doubtful; and in 39 the absence of inflammatory symptoms referable to the heart, together with the manifest enlargement of that organ, and the little alteration which the sounds underwent during the time the patient was under notice, induced a belief that the disease was of old standing. Now, supposing that 9 out of the 18 doubtful cases were examples of recent mischief, and 9 of old-standing disease, we get an aggregate number of 139 instances of recent, and 48 of old-standing cardiac disease, among 379 cases of acute and sub-acute rheumatism taken indiscriminately. In other words, we find that some form of heart affection existed in about half the cases (1 in every 2.02) of acute and sub-acute rheumatism taken conjointly; some recent mischief in more than one third (1 in every 2.7), and some old-standing mischief in one out of about every eight (1 in every 7.9).

This is the result when acute and sub-acute cases are viewed collectively; and it is sufficiently formidable in its character. But it assumes a still more serious aspect, when the acute are separated from the sub-acute cases, and are traced in their connection with the cardiac

tional causes. Any attempt, however, to enumerate the cases in which I believe the heart to have been previously affected, or the murmur to have arisen from functional causes, might possibly lead to error, and I have therefore abstained from hazarding an opinion on either of these points.

disease. Of the 130 instances of recent cardiac mischief no less than 114 occurred among the class of acute rheumatism, as did also 10 of the doubtful cases, and 21 of the cases of old-standing disease, making in all 145 instances of heart disease among 246 examples of acute rheumatism. Now supposing, as before, that half the doubtful cases were instances of recent, and half of old-standing cardiac mischief, we find the heart affected with recent disease in 119 instances, and with old-standing disease in 26 instances among 246 patients afflicted with acute rheumatism. In other words, we find some heart affection in about three fifths (1 in every 1·7) of all the cases; we get evidence of recent heart disease in almost one half (1 in every 2·06); and of old-standing disease in about one in every nine and a half (1 in every 9·4).

On the other hand, taking sub-acute rheumatism alone, a remarkable decrease is observed in the proportion of cases in which the heart is affected by pericarditis and other recent disease, and an equally striking increase in the proportion of old-standing cardiac affection. Among the 133 patients suffering from sub-acute rheumatism, there were 42 instances of cardiac disease; and of these, 16 were examples of recent affection of the heart; in 8 the date of the mischief was uncertain; and in 18 it was obviously of old standing. Dividing the doubtful cases as before, we obtain 20 as the aggregate number of instances in which the heart was recently affected, and 22 as the number in which it was previously diseased. In short, some form of heart disease appears to accompany about one third (1 in every 3·1) of all cases of sub-acute rheumatism; some *recent* heart affection, one in about every six and a half (1 in every 6·6); and some old-standing disease, one in every six (1 in every 6·04).

The difference of these results will be manifest from an

inspection of the following table, in which they are collocated and contrasted.

<i>No. of Cases of Rheumatism.</i>	<i>Total Heart Disease.</i>	<i>Recent Heart Disease.</i>	<i>Old-standing Heart Disease.¹</i>
Acute and Sub-acute 379	187, or 1 in every 2·02	139, or 1 in every 2·72	48, or 1 in every 7·89
Sub-acute . . . 133	42, or 1 in every 3·11	20, or 1 in every 6·65	22, or 1 in every 6·04
Acute 246	145, or 1 in every 1·69	119, or 1 in every 2·06	26, or 1 in every 9·46

Thus, it would appear, that 26² in 145, or 1 in every 5·57 of the cases of heart affection met with in acute rheumatism, are of old standing; 22² in 42, or 1 in every 1·9, of those accompanying the sub-acute form of the disease; and 48² in 187, or 1 in every 3·89, of those discovered in acute and sub-acute rheumatism taken indiscriminately.

Taking these facts as the foundation of my calculations, I find that those who have paid the closest attention to the subject, agree very nearly in fixing upon one half as about the proportion of cases in which cardiac affection ordinarily arises in the course of *acute* rheumatism. It occurred, as has been seen, in about this proportion (119 to 246), amongst the patients admitted into St. George's Hospital.² Dr. W. Budd met with it in about one half (21 in 43), of the cases which fell under his observation,³ and M. Boillaud discovered it in about the same proportion (65 in 114).⁴ Dr. Latham has reported cardiac affection in nearly two thirds (90 in 136) of his patients,⁵ but as he makes no mention of old-standing mischief, he probably includes in his calculations all previously existing cardiac lesions.

¹ It must be remarked, that these numbers fall short of the truth in regard to the amount of old-standing heart disease, inasmuch, as the heart was previously affected to a greater or less extent in several of the cases in which recent mischief occurred.

² This number includes half the cases of uncertain date.

³ 'Library of Medicine,' vol. v, p. 195.

⁴ 'Traité Clinique de Rheumatisme,' Preface, p. 12.

⁵ 'Clinical Medicine,' vol. i, p. 143.

If, then, in accordance with the results of my experience already given, we suppose 16, or 1 in every 5·57 of Dr. Latham's cases to have been of old standing, the proportion is reduced to 74 to 136, or to little more than that obtained by the authors before referred to. Again, Dr. Taylor, of Huddersfield, reports 37 cases of heart affection among 75 of his rheumatic patients,¹ but as this number includes both recent and old-standing heart disease, and is obtained from acute and sub-acute cases taken indiscriminately, it becomes necessary to subject both his numbers to correction before comparing them with the experience of others. If, then, in accordance with the results already given, we deduct 26, or rather more than one third of his cases (1 in every 2·8), as sub-acute, and suppose nine and a half, or 1 in every 3·89, of his cases of heart affection to be of old standing, we find that 49 represents the number of cases of *acute* rheumatism, and 27·5 the number of cases of *recent* heart affection, a result which tallies very closely with that which has been obtained by other observers. The trifling differences existing between the results of these various observations are exhibited in the following table.²

	Amount of recent Heart affection.	Number of Cases of Acute Rheumatism.	Proportion of Cases in which recent Heart affection occurred.
Cases under the care of the physicians at St. George's Hospital .	119	246	1 in every 2·06
Dr. Wm. Budd's Cases .	21	43	1 „ 2·04
M. Bouillaud's Cases .	65	114	1 „ 1·75
Dr. Latham's Cases . .	74	136	1 „ 1·83
Dr. John Taylor's Cases	27·5	49	1 „ 1·78
Total . . .	306·5	588	1 „ 1·91

¹ 'Med.-Chir. Trans.,' vol. xxviii, p. 483.

² In the construction of this Table, I have omitted Dr. Macleod's

A confirmation of these results is obtained by an examination of eleven cases, of which I have collected notes, in which, from the peculiar circumstances attending them, no regular medical treatment was adopted. In six of these, præcordial pain and anguish were reported to have existed at the time of the attack, and some evidence of unsoundness in the central organ of the circulation was manifest when the patients came subsequently under my notice. Two of these patients had previously suffered from acute rheumatism, and therefore may have had a murmur dating from, and referable to, their first attack: and in some of the others, also, the murmur may have been due to previous disease; but the symptoms experienced in the attack referred to, seem to show that the heart was then implicated in the mischief. Therefore, although these cases afford data too imperfect to form the groundwork of any accurate calculation as to the frequency of carditis, they may serve, nevertheless, to corroborate results obtained from more prolific sources.

I am thus induced to think that, under ordinary circumstances, some heart affection arises in about half of all cases of acute rheumatism; but I am persuaded that, by judicious treatment, this proportion may be very greatly reduced. Among 168 cases which have come under my care since I first commenced my present plan of treatment, the heart has been implicated in 31 cases only, and in at least 26 of these the affection had commenced before I saw the patient. This fact is almost sufficient of itself to afford decisive evidence on the subject, and to show that, in most cases, the heart may be protected from mischief when the patient is early

cases, which are inserted elsewhere, because he makes no mention of the frequency of endocardial affection, and their quotation therefore would only lead to error. On much the same grounds, no allusion is made to Dr. Basham's cases.

subjected to appropriate treatment. But the evidence is even more conclusive if my earlier and less actively-treated cases are excluded from the calculation. For amongst the last 126 cases in which the heart remained free from inflammation at the time the patients were first brought under my care, not a single case of endocarditis or pericarditis has occurred, the heart having been protected by the administration of remedies in the manner already pointed out.

The frequency of pericarditis is a point on which many opposite conclusions have been arrived at; the difference, I believe, resulting, as in the former instance, from the variety of the grounds chosen as the basis of calculation. Dr. Macleod¹ reports its occurrence in more than one fifth (52 in 226, or 1 in every 4·3,) of his patients suffering from one variety of acute rheumatism, and in about one sixth (54 in 307, or 1 in every 5·7,) of those afflicted with the different varieties taken collectively; Dr. Basham² reports it in about one fifth (14 in 66, or 1 in every 4·7,) of those suffering from acute articular rheumatism; Dr. Latham³ in about one sixth (22 in 136, or 1 in every 6·12); Dr. Taylor⁴

¹ On 'Rheumatism,' p. 154.

² 'Medico-Chir. Trans.,' vol. xxxii. Dr. Basham has reported 79 cases of rheumatism, but several of these are cases of "muscular" rheumatism, and one is called decidedly "chronic muscular." In short, he has reported only 66 cases of "acute arthritic" rheumatism.

³ 'Clinical Medicine,' vol. i, p. 144. Dr. Latham's numbers are 18 in 136, but he reports 9 cases in which it was doubtful whether a murmur which existed was referable to pericardial or endocardial disease, and it is therefore presumed, that 4 of these 9 doubtful cases were instances of pericarditis.

⁴ 'Medico-Chir. Trans.,' vol. xxviii, p. 483. Dr. Taylor's numbers

in about one sixth (8 in 49, or 1 in every 6·1): and I observed it in about the same proportion (39 in 246, or 1 in every 6·3,) among the cases of *acute* rheumatism admitted into St. George's Hospital. Dr. William Budd¹ met with it less frequently in his cases (5 in 43, or 1 in every 8·6;) but I have some doubts whether the cases Dr. Budd has recorded may not include examples of what I have termed "sub-acute" rheumatism, and if so, the disease probably occurred in somewhat less than one sixth of his acute cases (5 in 28, or 1 in every 5·6).

An equally striking uniformity is apparent in the result of a strict examination into the frequency of *recent* endocardial affection. It occurred in 107 of the 246, or in 1 out of every 2·3 of the cases of acute rheumatism already quoted as forming the basis of my calculations;² in 65 out of 136, or in 1 out of every 2·09, of Dr. Latham's cases;³ in 17·3 out of 43, or in 1 out of every 2·48, of Dr. William

are 8 in 75; but he admits that sub-acute cases are included, and about one third of the entire number have therefore been deducted on that score.

¹ 'Library of Medicine,' vol. v.

² These 107 cases are made up thus:—27 cases of endo-pericarditis; 75 of endocardial affection; and 5, or half of the cases in which the date of the mischief was uncertain. (See Table II, pp. 282-3.)

³ Dr. Latham reports 18 cases of exocardial, and 74 of endocardial affection, and 9 in which the seat of the disease was doubtful. Assuming that 4 of these doubtful cases were examples of exocardial disease, and 5 of endocardial affection, we get 22 cases of pericarditis, and 79 of endocardial mischief. The number 79, however, includes cases of old-standing cardiac lesions, and on this score, therefore, we must deduct 16, or 1 in every 5·57 cases. Hence the numbers given above.

Budd's cases;¹ and in 25·4 out of 49, or in 1 out of every 1·9, of Dr. Taylor's cases.²

A similar uniformity is also apparent in the result of an examination into the relative frequency of recent exocardial and endocardial affection. Amongst the cases I have reported, the former occurred in the proportion of 39 to 107, or of 1 to every 2·7 of the latter;³ in Dr. Latham's cases,³ of 22 to 65, or of 1 to every 2·9; in Dr. William Budd's,³ of 5 to 17·3, or of 1 to every 3·4; and in Dr. Taylor's,³ of 8 to 25·4, or of 1 to every 3·1. Dr. Macleod has not recorded any facts which assist us in determining the relative frequency of exocardial and endocardial disease; and Dr. Basham has recorded only 7 instances of endocardial murmur amongst his 77 cases of rheumatism, whilst among the same cases he has noted no less than 14 instances of acute pericarditis. The proportion which endocardial mischief is here made to bear to pericarditis, is so utterly at variance with the experience of all other observers, that it cannot be regarded as otherwise than exceptional, and I have therefore abstained from classing Dr. Basham's cases with the others. Possibly Dr. Basham, in the con-

¹ Dr. Wm. Budd's numbers are 21 to 43, but as he makes no mention of previously existing heart disease, it is assumed, in accordance with the results already given, that 3·7, or 1 in every 5·57, of his cases were instances of old-standing heart disease. Hence the numbers given above.

² Dr. Taylor's numbers are 34 to 75, but as the number 34 includes old-standing heart disease, and the number 75 is obtained from acute and sub-acute cases taken collectively, we must deduct 8·6, or 1 in every 3·89, of his 34 cases, as instances of old-standing disease, and 26, or 1 in every 2·8, of his 75 cases as sub-acute. Hence the numbers given above.

³ See the above Notes, and Notes (2, 3) on preceding page.

struction of his table, may have limited his report in great measure to the number of instances in which exocardial mischief was observed.

The results of these investigations are exhibited in the following tables :

TABLE I.—*Pericarditis.*

	Number of Cases of Pericarditis.	Number of Cases of Acute Rheumatism.	Proportion of Cases in which Pericarditis occurred.
Cases under the physi- cians at St. George's Hospital	39	246	1 in every 6·3
Dr. Basham's Cases .	14	66	1 „ 4·7
Dr. Wm. Budd's Cases .	5	43	1 „ 8·6
Dr. Latham's Cases .	22	136	1 „ 6·1
Dr. Macleod's Cases .	54	307	1 „ 5·7
Dr. Taylor's Cases . .	8	49	1 „ 6·1
Total	142	847	1 „ 5·97

TABLE II.—*Recent Endocardial Affection.*

	Number of Cases of recent Endo- cardial affection.	Number of Cases of Acute Rheumatism.	Proportion of Cases in which recent Endocardial affection occurred.
Cases under the physi- cians at St. George's Hospital	107	246	1 in every 2·29
Dr. Wm. Budd's Cases .	17·3	43	1 „ 2·48
Dr. Latham's Cases .	65	136	1 „ 2·09
Dr. Taylor's Cases . .	25·4	49	1 „ 1·92
Total	214·7	474	1 „ 2·25

TABLE III.—*Relative frequency of recent Exocardial and Endocardial Affection.*

	Number of Cases of Pericarditis	Number of Cases of recent Endo- cardial affection.	Proportion which recent Exocardial bears to recent Endo- cardial affection.
Cases under the physi- cians at St. George's Hospital	39	107	1 to every 2·7
Dr. Wm. Budd's Cases .	5	17·3	1 „ 3·4
Dr. Latham's Cases .	22	65	1 „ 2·9
Dr. Taylor's Cases . .	8	25·4	1 „ 3·1
Total	74	214·7	1 „ 2·9

The great excess in the frequency of endocardial affection exhibited in these Tables, arises, I believe, not from the greater frequency of endocarditis, but from the large number of cases in which a murmur is occasioned either by purely functional causes, or by temporary imperfect closure of the mitral orifice consequent on irregular contraction of the structures connected with the valves, or by the presence of fibrin deposited on the valves without the concurrence of endocardial inflammation. Judging from my observation of the cases which I noted during the period that I held the office of Medical Registrar, as also of those which have fallen under my notice since my appointment as one of the Physicians of St. George's Hospital, I believe that somewhat less than one third of all recent cardiac murmurs met with among patients suffering from acute rheumatism, will be found to result from pericarditis, and somewhat more than one third from endocarditis, whilst the remainder will be referable to one of the three causes above specified as contributing to the production of valvular murmur. This at least is certain, that the existence of recent valvular murmur was not accompanied by præcordial pain, nor by

any local symptoms of inflammation, nor by any increase in the general febrile symptoms, in more than 49 out of the 107 cases before alluded to, and that the murmur ultimately subsided altogether in many of the 58 cases in which no symptoms of inflammation were observed. The exact number in which it ultimately disappeared cannot of course be ascertained, but it had entirely ceased in 23 before the patients left the hospital.

In strong contrast with these results deduced from the statistics of cases treated under the various methods usually adopted, stands the evidence derivable from the records of the alkaline mode of treatment, which I have employed ever since the year 1845, and which I confidently introduced to the notice of the Profession, in the first edition of this work, published in the year 1852. Out of 168 patients whom I have treated for *acute* rheumatism after the plan then recommended, only 31 have shown symptoms of cardiac inflammation, and of these no less than 26 were affected before I saw them, and 4 others before they could be brought under the influence of the remedies. In eight instances, simple pericarditis existed; in six others, pericarditis was complicated with recent endocarditis, and in the other seventeen, endocardial mischief was present alone. Taking these figures as they stand, they show pericarditis occurring once in every 12 cases, instead of in every 5·93 cases; and endocardial affection once in every 9·8 cases instead of in every 2·25 cases; whilst, if we exclude those instances in which cardiac disease had manifested itself before the patient came under treatment, the pleasing fact appears, that pericarditis occurred only once in every 84 cases, and endocardial affection once in every 56 cases. Nor is this conclusion inconsistent with the experience of others. Several medical gentlemen who at my recom-

mendation have adopted the alkaline method of treatment, assure me that their patients have enjoyed an equal immunity from heart affection; and Dr. Garrod, who, since May, 1852, has been following a similar line of practice, states that "in no case did affection of the heart ensue after the patient had been more than forty-eight hours under the influence of the medicine."¹ Thus the statements contained in the first edition of this work are confirmed by the testimony of other observers, and it becomes apparent that if the patient be seen early and treated judiciously, after the method I was the first to recommend, rheumatic inflammation of the heart may be generally prevented. In short, the conviction is forced upon us that this fearful disease—fearful, not so much from the pain it causes, as from the damage it inflicts on the central organ of circulation—may thus be robbed of more than half its terrors.

But to return to the ordinary statistics of heart disease in connection with rheumatism.

That the age of the patient has a powerful influence in determining the access of cardiac mischief, is sufficiently apparent from the Tables appended to this Chapter, for it will be observed² that no less than 114 out of the 130 cases of recent heart affection before referred to occurred in patients under the age of 30. In the production of exocardial inflammation alone, its influence is even more apparent; for 23 out of 41 instances, or above one half, were met with in patients who did not exceed the age of 20, and 37 out of the 41, in patients under the age of 30, while 4 only out of the whole number exceeded that age. Nor has the influence of age been less strikingly displayed in the

¹ 'Med.-Chir. Trans.,' vol. xxxviii, p. 151.

² See Table I, pp. 280-81.

cases observed by others. Drs. Rilliet and Barthez¹ report pericarditis in more than one third (4 in 11) of their rheumatic children patients. Dr. Macleod noted its occurrence in exactly one half (4 in 8) of his children patients;² and of Dr. Taylor's, "15 patients having rheumatic pericarditis, nine, or two thirds, were 20 years old, or under; five between 20 and 26 years; and the remaining one only was above 40 years of age."³

This proneness to heart disease, and more especially to inflammation of the pericardium, which thus appears to attach to youth, might be supposed explicable by the frequent occurrence of acute rheumatism in persons of tender years. But the Tables show⁴ that this will not serve to clear up the mystery, for although acute rheumatism is certainly most common in early life, yet the relative frequency of pericarditis is found to vary in tolerably exact proportion to the age of the sufferer. Thus, it occurred in rather more than one third (8 in 22, or 1 in every 2·75,) of all below the age of 15; in less than one fifth (15 in 82, or 1 in every 5·4,) of those between the ages of 15 and 20; and in less than one tenth (9 in 92, or 1 in every 10·2,) of those between the ages of 20 and 25; whilst, above the age of 25, the proportion of cases in which it occurred, diminishes with even greater rapidity. The more probable explanation is that which I have offered in another Chapter,⁵ viz., that in youth the heart is extremely irritable, and therefore specially prone to suffer from any disturbing influence.

¹ 'Traité Clinique et Pratique des Maladies des Enfants,' vol. i, p. 210.

² On 'Rheumatism,' pp. 156-7.

³ 'Medico-Chir. Trans.,' vol. xxviii, p. 528.

⁴ See Tables, pp. 280-4.

⁵ Cap. VI, pp. 146-8.

Whether sex may influence the production of heart-disease in connection with rheumatism, is a question on which we have hardly enough facts to warrant our drawing any positive conclusions. The 'Tables I have given,'¹ however, show that some recent cardiac mischief was observed in 1 out of every 3·1 men (71 in 223), and in 1 out of every 2·2 women (68 in 156); that pericarditis occurred once in every 12·4 men, and in 1 out of every 6·7 women; or taking "acute rheumatism" alone, in 1 out of every 7·7 men, and in 1 out of every 5·2 women; and that recent endocardial affection occurred in 1 out of every 3·4 men, and in 1 out of every 2·6 women; or taking acute rheumatism alone, in 1 out of every 2·4 men, and in 1 out of every 2·1 women. It would thus appear, that heart-disease is more common among women than among men, a circumstance which accords completely with the experience of Dr. Macleod,² and with the more recent observations of my successor, Dr. Barclay.³ If the extraordinary proneness to heart disease, engendered by youth, be attributable, as I believe it to be, to the greater irritability of the heart at that age, it is probable that the fact of the heart being usually more irritable in women than in men, may be the reason of its being more commonly affected in the one case than in the other. Thus this circumstance, if verified by more extended observations, may serve as

¹ See Tables appended to this Chapter, pp. 280-2. The numbers 71 and 68 include half the cases of uncertain date.

² Dr. Macleod reports, "of the total number of patients labouring under acute rheumatism, 137 were males, and 89 females. Of the former 28, and of the latter 24, had symptoms of pericarditis; or of the men, rather less than 1 in 5, and of the women, rather more than 1 in 4." (On 'Rheumatism,' p. 154.)

³ See 'Lancet' for July 26th, 1851, and 'Medico-Chir. Trans.,' vol. xxxv, p. 18.

another link in the chain of evidence adduced to show how closely the occurrence of cardiac inflammation is connected with the heart's irritability.

The form which the articular symptoms assume, is obviously connected more or less closely with the frequency of cardiac affection, and affords a tolerable criterion as to the probability of its occurrence. Whether owing to the age and strength of the patient, or in consequence of some obscure constitutional peculiarity, most certain it is that the fibrinous structures are peculiarly apt to suffer in youth, and the synovial membranes in more advanced age, and that the occurrence of heart affection is allied most closely to the former variety of articular inflammation. Of the 52 cases of pericarditis reported by Dr. Macleod, no less than 50 occurred among patients in whom the fibrinous symptoms were strongly marked;¹ Dr. Taylor's instances all occurred in the same class of cases;² and so did all the 41, save 3, to which I have already referred. I would not, however, be misunderstood on this subject. In acute rheumatism the fibrous and the synovial symptoms are usually more or less intimately blended, the fibrous symptoms predominating at one period of the attack, the synovial symptoms at another; and it has been already stated, that no difference exists between those cases in which the fibrous symptoms are most developed and those in which the synovial symptoms are more prominent, beyond that which is impressed upon them by peculiarities of age, sex, constitution, and the like. The former, however, are those which chiefly occur in youth, and are marked by the greatest amount of febrile disturbance, and are therefore the very cases which are especially

¹ On 'Rheumatism,' p. 113.

² 'Medico-Chir. Trans.,' vol. xxviii, p. 522.

prone to the invasion of pericarditis. Synovial effusion is not necessarily absent, but the fibrous symptoms are most conspicuous. I am not aware that the same relationship has been traced between fibrous rheumatism and endocardial inflammation; nor, indeed, can such a relationship be discovered, if all endocardial murmurs are to be taken as indications of existing endocarditis. But close observation has led me to believe that it exists in an equally striking degree; and that all efforts to trace it have proved ineffectual, simply because forms of cardiac affection which may of course coexist with any form of rheumatism, such, for instance, as old-standing valvular disease, and functional murmurs in no way referable to cardiac inflammation, have been included among the cases which have formed the subject of investigation. When these are excluded, the connection will always be apparent and striking. Of the 107 instances of recent endocardial affection observed in connection with acute rheumatism, 58, as already stated, were unaccompanied by any local or general symptoms of cardiac inflammation, and many of these occurred in patients in whom synovitis was a prominent feature. But of the 49 which did present undoubted evidence of cardiac inflammation, no less than 42 occurred in cases in which fibrous symptoms were strongly developed.

As to the exact period of the attack at which heart affection most commonly arises I am not able to speak with certainty, nor indeed can I conceive that under any circumstances the information obtained at large public institutions can give us more than an approximation to the truth. For, judging from my own observation, nearly half the instances of recent cardiac affection commence before the patient's admission into the hospital, and therefore before it is possible to obtain any accurate information as to the date of

the mischief; and if such cases are to be excluded from the calculation, the results cannot be otherwise than erroneous. The facts I have obtained, however, stand thus. Inflammation of the heart occasionally shows itself as the first and for some time the only local symptom of rheumatism;¹ more commonly it arises between the second and the twentieth day of the attack, and sometimes, when the rheumatism is obstinate and lingering, does not supervene until the twenty-fourth day, or even a later period. In most instances it arises when the fever is at its height.

Of the 41 cases of pericarditis already so often referred to, 19, at the date of their admission into the hospital, gave evidence of existing cardiac inflammation. On the average, pericarditis had commenced in these cases before the seventh day of the attack. Of the remaining 22—

2 occurred on the fifth day of the rheumatic fever.

5	”	sixth	”
4	”	seventh	”
5	”	eighth	”
2	”	tenth	”
2	”	twelfth	”
1	”	seventeenth	”
1	”	twenty-fourth	”

Of the 126 instances of recent endocardial affection noted during the same period, 53 existed at the time of the patient's admission into the hospital; in 17 of the other 73, in which a murmur was not developed until after the patient's admission, I have no note to enable me to deter-

¹ I have met with five instances, in which the heart was affected for some time prior to the development of articular symptoms; but none of these occurred among the cases which are included in the present calculation.

mine the exact date of the mischief; but of the remaining 56—

1	occurred on the	third day of the rheumatic fever.
3	„	fourth „
2	„	fifth „
15	between the	sixth and the tenth days.
13	„	tenth and the fifteenth days.
11	„	fifteenth and the twentieth days.
5	„	twentieth and the twenty-fifth days.
6	after that date.	

Dr. William Budd reports the occurrence of cardiac affections as most common between the eighth and the twenty-seventh day of the rheumatic attack;¹ but Dr. Taylor, who speaks from his observation of 15 cases, says heart affection occurs in fully one half of the cases before the fourth day of the disease.²

Whether a predisposition to affection of the heart may not be engendered by the occurrence of a previous attack of pericarditis or endocarditis is a question on which I have hardly sufficient data to enable me to speak with confidence. Theoretically it is certain that the occurrence of cardiac inflammation must for ever after render the heart more than ordinarily liable to be affected, on the same principle that a joint which has been strained or injured is afterwards peculiarly susceptible of morbid influences; and it is equally certain that, as far as they go, the ascertained facts corroborate this view, for they show that the heart is less liable to suffer in primary invasions of rheumatism than in cases where there has been a previous attack, and where, therefore, the heart may have been previously implicated. Of the 246 cases of acute rheumatism already referred to, 138 were

¹ 'Library of Medicine,' vol. v, p. 195.

² 'Medico-Chir. Trans.,' vol. xxviii.

instances of a first attack, 84 were cases in which there had been one or more previous attacks, and 24 were cases in which, either from my inability to obtain the requisite information, or from some other cause, I have made no note on the subject. Amongst the cases which form the first of these classes, there occurred only 59 examples of heart complications, whilst there were no less than 48 in the second; in other words, some recent heart disease occurred in 41·8 per cent. of the first attacks, and in 55·8 of the subsequent attacks.¹

But although these facts exhibit a lesser tendency to heart affection in primary than in subsequent attacks of acute rheumatism, the proportions are altogether changed when those cases only are examined in which there is unequivocal evidence of true cardiac *inflammation*. Thus, of the 39 cases of pericarditis which were met with in the class of acute rheumatism, 25 occurred in primary and 14 only in subsequent attacks, and in several of these 14 there was a tolerably distinct history of the heart having been implicated during the former invasion of rheumatism. Taking the figures as they stand, however, they exhibit pericarditis occurring in 18·1 per cent. of the primary and in 16·6 only of the subsequent attacks, and afford one among many presumptive proofs that a large proportion of the endocardial murmurs which arise during the course of acute rheumatism, are not attributable to true inflammation.

¹ The statistics drawn up by Dr. Barclay, my successor as Medical Registrar of St. George's Hospital, from his observation of the cases admitted during the two years ending Dec. 31st, 1850, show that cardiac complication occurred 18 or 20 per cent. more frequently in subsequent rheumatic attacks than in primary ones. For further details on this subject, see 'Med.-Chir. Trans.,' vol. xxxv, p. 18.

TABLE I.

Abstract of Cases of Acute and Sub-acute Rheumatism, admitted into St. George's Hospital, between the 1st of January, 1845, and the 1st of May, 1848, showing the number which were complicated by disease of the Heart; the Age and Sex of the Patients in whom it occurred, the form which it assumed, and the proportion in which each form occurred amongst the two Sexes.

Total number of Cases, 379. Of which, 223 occurred in men, and 156 in women.

Heart affected in 187 instances. Healthy in 160 instances. Not noted in 32.

Of the 187 instances of Heart affection, 130 were cases in which the disease was of recent origin.

"	"	39 were cases in which the disease was of old standing.
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"	"	18 were cases in which the disease was of uncertain date.
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Of the 130 cases of recent Heart disease, 13 were instances of Pericarditis alone.

"	"	28 were instances of Endo-pericarditis.
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"	"	89 were instances of Endocardial affection alone.
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The 18 cases of uncertain date were all instances of Endocardial disease.

Of the 13 cases of Pericarditis, 6 occurred in men, and 7 in women.

"	28	"	Endo-pericarditis, 12 occurred in men, and 16 in women.
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"	89	"	recent Endocardial affection, 48 occurred in men, and 41 in women.
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"	39	"	old-standing disease, 23 occurred in men, and 16 in women.
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"	18	"	uncertain date, 10 occurred in men, and 8 in women.
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Pericarditis then occurred once in every 12·4 men, and once in every 6·7 women.

Recent Endocardial affection once in every 3·4 men, and once in every 2·6 women.

Old-standing Heart disease once in every 7·9 men, and once in every 7·8 women.

	Cases of acute and sub-acute Rheumatism.	Total Heart Disease.	Pericarditis.	Endo-Pericarditis.	Recent Endocardial Affection.	Old-standing Valvular and perhaps Exocardial Disease.	Valvular Disease of uncertain date.
Under 15	22	12	3	5	3	—	1
15 to 20	82	49	4	11	26	4	4
20—25	92	49	3	6	26	9	5
25—30	79	41	1	4	22	9	5
30—35	40	14	1	1	4	6	2
35—40	28	12	—	1	4	6	1
40—45	15	5	1	—	2	2	—
45—50	14	4	—	—	2	2	—
50—55	3	—	—	—	—	—	—
55—60	4	1	—	—	—	1	—
	379	187	13	28	89	39	18

TABLE II.

Abstract of Cases of Acute Rheumatism, admitted into St. George's Hospital, from January 1st, 1845, to May 1st, 1848, showing the number which were complicated by Heart disease; the Age and Sex of the Patients in whom it occurred, the form which it assumed, and the proportion in which each form occurred amongst the two Sexes.

Total number of Cases, 246. Of which 131 occurred in men, and 115 in women.

Heart affected in 145 instances. Healthy in 93 instances. Not noted, and therefore probably healthy in 8.

Of the 145 instances of Heart affection, 114 were cases in which the disease was of recent origin.
 „ „ 21 were cases in which the disease was of old standing.

Of the 145 instances of Heart affection, 10 were cases in which the date of the disease was uncertain.

Of the 114 cases of recent Heart disease, 12 were cases of Pericarditis alone.

„ „ 27 were cases of Endo-pericarditis.

„ „ 75 were cases of Endocardial affection alone.

The 10 cases of uncertain date were all instances of Endocardial disease.

Of the 12 cases of Pericarditis, 5 occurred in men, and 7 in women.

„ 27 „ Endo-pericarditis, 12 occurred in men, and 15 in women.

„ 75 „ Recent Endocardial affection, 39 occurred in men, and 36 in women.

„ 21 „ Old-standing disease, 11 occurred in men, and 10 in women.

„ 10 „ uncertain date, 6 occurred in men, and 4 in women.

Pericarditis then occurred once in every 7·7 men, and once in every 5·2 women.

Recent Endocardial affection once in every 2·4 men, and once in every 2·1 women.

Old-standing heart affection once in every 9·3 men, and once in every 9·5 women.

	Cases of Acute Rheumatism.	Total Heart Disease.	Pericarditis.	Endo-Pericarditis.	Recent Endocardial Affection.	Old-standing Valvular and perhaps Exocardial Disease.	Valvular Disease of uncertain date.
Under 15	15	9	2	5	2	—	—
15 to 20	58	37	4	10	21	1	1
20—25	63	39	3	6	22	5	3
25—30	50	33	1	4	20	4	4
30—35	22	11	1	1	4	4	1
35—40	17	8	—	1	3	3	1
40—45	9	4	1	—	1	2	—
45—50	9	3	—	—	2	1	—
50—55	1	—	—	—	—	—	—
55—60	2	1	—	—	—	1	—
	246	145	12	27	75	21	10

TABLE III.

Abstract of Cases of Sub-acute Rheumatism admitted into St. George's Hospital, between the 1st of January, 1845, and the 1st of May, 1848, showing the number complicated by Heart disease; the Age and Sex of the Patients in whom it occurred, the form which it assumed, and the proportion in which each form occurred amongst the two Sexes.

Total number of Cases, 133. Of which 92 occurred in men, and 41 in women.

Heart affected in 42 instances. Healthy in 67 instances. Not noted in 24.

Of the 42 instances of Heart affection, 16 were cases in which the disease was of recent origin.

„ „ 18 were cases in which the disease was of old standing.

„ „ 8 were cases in which the date of the disease was uncertain.

Of the 16 cases of recent Heart disease, 1 was a case of Pericarditis alone.

„ „ 1 was a case of Endo-pericarditis.

„ „ 14 were cases of Endocardial affection alone.

The 8 cases of uncertain date were all instances of Endocardial disease. The 1 case of Pericarditis occurred in a man.

„ 1 „ Endo-pericarditis occurred in a woman.

Of the 14 cases of recent Endocardial affection, 9 occurred in men, and 5 in women.

„ 18 „ old-standing disease, 12 occurred in men, and 6 in women.

„ 8 „ uncertain date, 4 occurred in men, and 4 in women.

Pericarditis then occurred once in every 92 men, and once in every 41 women; or in little more than 1 per cent. among the men, and $\frac{1}{4}$ per cent. among the women.

Recent Endocardial affection occurred once in every 8.3 men, and once in every 5.1 women.

Old-standing Heart disease occurred once in every 6.5 men, and once in every 5.1 women.

	Cases of Sub-acute Rheumatism.	Total Heart Disease.	Pericarditis.	Endo-Pericarditis.	Recent Endocardial Affection.	Old-standing Valvular and perhaps Exocardial Disease.	Valvular Disease of uncertain date.
Under 15	7	3	1	—	1	—	1
15 to 20	24	12	—	1	5	3	3
20—25	29	10	—	—	4	4	2
25—30	29	8	—	—	2	5	1
30—35	18	3	—	—	—	2	1
35—40	11	4	—	—	1	3	—
40—45	6	1	—	—	1	—	—
45—50	5	1	—	—	—	1	—
50—55	2	—	—	—	—	—	—
55—60	2	—	—	—	—	—	—
	133	42	1	1	14	18	8

CHAPTER X.

ON AFFECTIONS OF THE BRAIN, INFLAMMATION OF THE LUNGS AND PLEURÆ, AND DISORGANIZATION OF THE JOINTS.

ALTHOUGH inflammation of the membranes of the heart is by far the most common complication of acute rheumatism, yet do we sometimes meet with symptoms indicative of derangement in other organs. Among these, the most formidable are suggestive of disorder of the cerebral structures. A patient, for instance, who for a week or ten days has been suffering from acute rheumatism, and has presented no untoward symptom, after passing one or two restless nights becomes strange and flighty in his manner, complains, perhaps, of headache, and is shortly seized with furious delirium, during which he appears to be insensible to pain, and moves his limbs in utter disregard of his inflamed and exquisitely painful joints. And then, if he does not shortly improve, he either dies of exhaustion or falls into a state of profound coma, and expires in the course of a few hours.¹

Symptoms such as these were formerly referred to inflammation of the brain or its meninges, and the unfortunate sufferer was bled from the arm, or leeches on the temples, and subjected to such other antiphlogistic treatment as

¹ Some of these cases are characterised from the first by a strange waywardness and taciturnity.

appeared called for by the urgency of the supposed cerebral symptoms.¹ But pathological research has at length discovered that cerebral disturbance is not always symptomatic of cerebral inflammation, and that a patient suffering from acute rheumatism may pass into a state of violent delirium, and die comatose or convulsed, although on dissection neither the brain nor its membranes present the slightest trace of inflammatory action. Nay, more, it has been proved beyond dispute, that although in some rare instances the symptoms alluded to, *do* indicate inflammation of the brain or its meninges, yet that such is very rarely the case; that, more generally, they are coincident with inflammatory action about the heart, and are unconnected with any cerebral lesion; not unfrequently accompany pleuritis or pneumonia; and occasionally present themselves to an alarming extent, when neither the brain, nor the heart, nor the lungs are affected.

The question, therefore, naturally suggests itself,—to what are these cerebral symptoms attributable? Are they to be regarded as tokens of threatening mischief within the cranium? or as evidences of the lighting up of some distant internal local inflammation? or as expressions of alarm experienced by the system generally, and by the sensorium, the source of the system's consciousness, at the interference with its nutrition resulting from the poisoned condition of the blood?

To me I confess the latter appears the only satisfactory explanation.

At one time all cerebral symptoms which occurred in the course of acute rheumatism were referred to inflammation

¹ For an illustration of this fact, consult the record of a case reported by Mr. Stanley, in the seventh volume of the 'Medico-Chir. Trans.'

of the brain or its membranes, resulting, as was supposed, from metastasis of the morbid action to the cerebral structures, in consequence of the subsidence of articular inflammation. But their independence of metastatic action is attested, by their not unfrequent occurrence without the subsidence of articular inflammation; and their independence of mischief developed within the cranium is abundantly proved by dissection after death, which, even when the case has terminated fatally, fails utterly, in most cases, in affording the slightest evidence of cerebral mischief.¹

The second suggestion is more in accordance with sound pathology, but nevertheless is not quite satisfactory. Soon after the discovery that cerebral disturbance may arise in the course of acute rheumatism, without the concurrence of cerebral inflammation, delirium was so often found associated with active cardiac disease, that many persons were led to regard disorder of the sensorial functions as invariably connected with mischief occurring in the central organ of the circulation. The old-fashioned doctrine of metastasis to the brain exploded under the influence of pathological research, and the heart was in every case pronounced to be the "*fons et origo malorum*." By some, its anatomical relations with the cerebrum were pointed to, in explanation of the symptoms observed, and the delirium was attributed to

¹ In proof of this, I would refer to the case recorded at pp. 307-8 of this Treatise, as also to the valuable cases reported by Dr. Richard Bright, in his account of spasmodic diseases accompanying affections of the pericardium; by Dr. George Burrows, in his work on '*Disorders of the Cerebral Circulation*;' by Dr. Latham, in his work on '*Clinical Medicine*;' by Dr. Todd, in his *Lumleian Lectures*; and by Dr. Watson, in his '*Practice of Physic*.' Andral, Bouillaud, Davis, Rostan, Stanley, and others, have reported similar symptoms connected with pericarditis, when occurring without any accompanying rheumatism.

irritation conveyed to the brain by the phrenic¹ and pneumogastric² nerves, as a consequence of inflammation of the pericardium or endocardium. By others, however, sympathetic irritation was considered inadequate to explain the symptoms, which were therefore attributed to disturbance of the cerebral circulation, occasioned by the embarrassment of the heart's action, which results from the access of cardiac inflammation.³ But neither of these interpretations appears to me correct, inasmuch as delirium, convulsions, and coma, are always rare and exceptional phenomena, even when carditis terminates fatally; not unfrequently arise in cases distinguished by less than the average severity of their cardiac symptoms, and in which, therefore, presumption favours the belief, that there is no unusual irritation of the cardiac nerves; and occur sometimes when dissection after death proves the heart and its membranes to be quite free from disease, and when, therefore, the non-existence of such a cause of irritation is placed beyond all doubt.⁴

¹ Dr. R. Bright and M. Bouillaud.

² Dr. Hope, *op. cit.*

³ Dr. Watson's 'Practice of Physic,' ed. i, vol. ii, p. 276; and Dr. Burrows on 'Disorders of the Cerebral Circulation,' p. 212.

⁴ In a review of the first edition of this work, it was suggested that the detachment of fibrinous vegetations from the valves on the left side of the heart, and their impaction in the vessels supplying the brain, may be the cause of cerebral disturbance in these cases. This supposition, however, is simply gratuitous, and without foundation. In the valuable records of fibrinous plugging of the cerebral vessels, published by Dr. Kirkes, in vol. xxxv of the 'Medico-Chirurgical Transactions,' hemiplegia, and not delirium, resulted from the cause alluded to; and extensive softening of the cerebral structure was the characteristic pathological phenomenon—results totally unlike those which are met with in connection with rheumatic delirium.

The same observations apply with equal if not greater force, to those instances in which cerebral symptoms are coincident with inflammation of the respiratory organs. That considerable disturbance of the sensorial functions is sometimes associated with pleurisy and pneumonia when occurring in the course of acute rheumatism, is a fact familiar to all practical men, nor can it admit of question, that such a complication must interfere materially with the maintenance of a due circulation through the brain. But equally certain is it, that extensive mischief may take place in the lungs, or within the cavities of the pleuræ, unattended by any symptoms, however slight, of cerebral disturbance; and, on the other hand, that delirium of a most violent character may be, and frequently is met with, unaccompanied by any evidence, either general or physical, of pulmonary inflammation. So, even admitting that carditis and pleuropneumonia *do* exercise some influence in producing cerebral disturbance, they can be regarded only as occasional and accessory causes.

It is far different, however, in regard to the third suggested cause of rheumatic delirium. The blood, in every case of rheumatism, is poisoned by the presence of morbid matter, and the nutrition of the brain is interfered with in consequence; and although delirium, convulsions, and coma, may result in turn from cerebro-spinal inflammation, yet an altered condition of the circulating fluid is equally, if not more energetic in their production.¹ Every one, for instance, knows how certainly excitement or profound coma is caused by the ingestion of inordinate quantities of spirituous liquors, and by the action of belladonna and other poisonous agents;

¹ For full and copious illustrations of this important fact, see Dr. Todd's *Lumleian Lectures*, for 1850.

how frequently delirium results from the deleterious influence of urea, and how often it accompanies typhus fever, erysipelas, and almost every exanthematous disorder. Yet, in all these cases, dissection after death has shown that such symptoms afford not the slightest ground for the presumption of cerebral congestion or cerebral inflammation. The brain has been found paler and drier than usual, or of a darker colour, and marked by an increased number of bloody puncta, and sometimes a small quantity of serum has been discovered under the pia mater or in the ventricles, as the result of a retarded cerebral circulation. Rarely, however, has there been any trace of inflammatory action, or of any other organic lesion. In fact, experience has shown, that whenever the blood is poisoned, or altered in character, as it is in all the cases referred to, there may occur, without any local inflammation, every shade and variety of cerebral disturbance, from slight wandering or flightiness to violent maniacal delirium, accompanied or unaccompanied by convulsions, or tetanic spasms, and terminating in recovery, or in death by coma.

A distempered condition of the blood, then, I conceive to be the true proximate cause of the sensorial disturbance occasionally observed in the course of acute rheumatism.¹ For whilst we find acute rheumatism attended by every species of delirium, and every variety of spasmodic action, we find almost invariably, as in the cases just alluded to, a total absence of morbid appearances within the cranium or

Dr. Todd has urged this view most closely and forcibly in his admirable Lectures on Delirium and Coma, delivered before the Royal College of Physicians, but he does not appear to have dwelt sufficiently on the causes which give effect to the operation of the poison in certain cases, and which by their absence prevent cerebral disturbance in others.

the spinal cord, capable of accounting for the cerebral or cerebro-spinal disturbance. And although this disturbance is sometimes associated with inflammation in other organs, yet instances are not wanting in which delirium, by taking place without the concurrence of any internal inflammation, asserts its independence of all local action, and ranks itself amongst the symptoms known to be dependent on a vitiated condition of the circulating fluid; a position which is strongly supported by the fact that, in gout, an analogous disorder, in which the blood has been shown to be poisoned,¹ we meet with a similar affection of the nervous centres, unaccompanied by any evidence of cerebro-spinal inflammation.

But admitting the altered condition of the blood to be the primary cause of the brain's disturbance, yet as its character is *always* altered in rheumatism, and head symptoms *seldom* occur, there must be some further influences at work which determine the occurrence of delirium in certain cases and its total absence in others. By looking carefully to the circumstances under which cerebral symptoms are most apt to arise in different disorders, we may glean important information on the subject. It is well known that persons of a nervous excitable disposition are more apt to experience ill effects from any interference with their functions, than are others of a more vigorous and less irritable temperament. Moreover, it has been ascertained, that nervous susceptibility is most fully displayed when the constitution has been damaged by habits of intemperance or by long-continued ill health. Not only are persons more prone under such circumstances to suffer severely from local injuries, but they are apt to exhibit symptoms of irritation

¹ *Vide* 'Medico-Chir. Transactions,' vol. xxxi, p. 83.

from causes which, in persons of a healthy constitution and less excitable habit, would hardly give rise to any disturbance. Thus it is that in habitual drunkards, whose constitutions are shattered, and whose nervous systems have long been unduly exalted or depressed, comparatively small potations on the one hand, or on the other a brief abstinence from accustomed stimulus, or any temporary depressing cause, will seldom fail to induce an attack of delirium tremens. Hence also the frequency of traumatic delirium, and of the delirium which so constantly accompanies erysipelas in persons whose constitutions have been severely taxed. The excess or the deficiency of the accustomed stimulus in the case of the drunkard; the shock, and the loss of blood in the case of the wounded man; and the poison of the disease in the last instance, proves sufficient to disturb the relationship subsisting between the blood and the nervous centres. With a brain participating in the general mal-nutrition of the body,—a heart weak, ill nourished, ill supplied with nervous stimulus, and hardly capable of maintaining a due circulation,—and a blood long vitiated or impoverished, it is not difficult to conceive that a slight additional cause of irritation or depression may prove sufficient to disturb the brain's equilibrium, and that an attack of delirium may supervene, whenever, by the presence of some fresh morbid matter, by an increase of the watery part, or a diminution in the coloured corpuscles of the blood,¹ or indeed by any material alteration in the character of the circulating fluid, the nutrition of the nervous centres is still further interfered with. Nor is it to be wondered at that, from the same cause, an attack of carditis, or pleuro-pneumonia, should in many cases determine the

¹ The natural result of hæmorrhage or venæsection.

access of cerebral symptoms. The shock resulting from the occurrence of inflammation in such vital organs as the heart or lungs, must surely so far influence the circulation as to cause the blood to be sent to the brain less forcibly and less regularly than before: indeed, we have proof of such an influence in the weak, irregular, and intermittent pulse, by which the invasion of carditis is often accompanied; and this, in a person already predisposed by the vitiated condition of the blood, would probably disturb the brain's nutrition sufficiently to give rise to symptoms of undue excitement or undue oppression.¹

Thus, then, it would appear that, in all cases in which cerebral disturbance presents itself during the course of acute rheumatism, the altered condition of the blood is its primary or proximate cause; that neither delirium nor coma is necessarily accompanied by any internal inflammation, whether of the brain, the heart, or the lungs: nevertheless, internal inflammation, more especially of the heart and lungs, is very liable to arise as a consequence of the irritation of the vitiated blood; and when so arising, is apt to be accompanied by sensorial derangement, for the reason that, under the circumstances of the case, it makes up the sum or amount of derangement which is requisite to disturb the brain's equilibrium. Indeed, so rarely is such disturbance effected in acute rheumatism without its influence, that for all practical purposes delirium may be considered

¹ "With the heart patched inside and out with lymph, ulcerated it may be in its very substance and valvular structure, while fevered acid blood is at the same time in circulation through the system, there can be no reason to marvel at the occurrence of 'head-symptoms' in rheumatic fever, even though the brain and its investing membranes be not inflamed." (Dr. Wilson, 'On the True Character of Acute Rheumatism,' 'Lancet' for 1844, vol. ii, p. 218.)

as indicative of some commencing internal complication, and very generally of inflammation of the heart.

The same holds good in regard to those cases which are attended, not only by disturbance of the intellectual faculties, but by symptoms indicative of spinal irritation. Just as delirium may result from the direct action of the rheumatic poison on the brain, so convulsions, and other spasmodic affections, which are sometimes met with in acute rheumatism, may take their origin in spinal irritation caused by the action of the same morbid agent. In the first-named cases, dissection after death very generally fails in revealing any trace of mischief within the cranium; and, in the last, the spinal cord and its membranes are found equally free from organic lesion. Both classes of cases, however, are usually distinguished by extensive inflammation of the pericardium or pleuræ; and in the one, as in the other, this local inflammation appears to be connected with, if indeed it be not the exciting cause of, the disturbance observed in the cerebro-spinal functions. In the former it obviously interferes with the due maintenance of the cerebral circulation, and is thus probably conducive to the setting up of delirium: in the latter it doubtless produces a similar derangement in the spinal system, and so gives rise to convulsive actions. Probably, however, the symptoms in the latter, if not also in the former cases, are more or less connected with the irritation of those branches of the phrenic and pneumogastric nerves which are distributed over the inflamed parts; for it has been observed that, in the cases most remarkable for choreic or tetanic convulsions, and other symptoms of spinal irritation, the inflammation has not been confined to the internal surface of the pericardium, but has extended to its external surface and to the diaphragmatic pleura, where branches

of the phrenic and pneumogastric nerves are distributed most abundantly.¹

The description I have given of the circumstances under which cerebro-spinal symptoms are most apt to make their appearance, sufficiently indicates the class of cases in which we may reasonably expect their occurrence. It is not necessarily in those persons whose articular inflammations are most numerous and severe, but in those who are pale, weakly, and unhealthy; who have been much reduced by bloodletting, or by excessive and long-continued perspiration; who are attacked after overlong lactation, or during recovery from serious illness; or who again, as Dr. Watson has remarked,² experience a relapse after a long and tedious attack of rheumatism. It is with rheumatism, just as with gout: the plethoric healthy subject, though undergoing martyrdom from inflammation of his joints, escapes without the slightest disturbance of his sensorial functions, whilst the thin, the sallow, and unhealthy, who have long suffered from constitutional derangement, whose kidneys and liver are defective in action, whose blood is altogether vitiated, and whose nervous centres cannot fail to sympathise largely in the general disturbance, though presenting far less active local symptoms of disease, are affected with delirium, and die comatose or convulsed.

Thus, then, as head symptoms are invariably connected with great susceptibility of the nervous centres, are usually

¹ For cases in illustration of these facts, see Dr. R. Bright's essay 'On Spasmodic Diseases accompanying Affection of the Pericardium,' *Medico-Chir. Trans.*, vol. xxii; Bouillaud's *Traité des Maladies du Cœur*; Dr. Burrows, 'On Disorders of the Cerebral Circulation,' pp. 210—212; and Dr. Hope, 'On Diseases of the Heart.'

² 'Practice of Physic,' ed. 1, vol. ii, p. 283.

accompanied by active inflammation of some internal organ, and occur almost always in persons of a weak excitable habit, they are always indicative of extreme danger, even when unattended by cerebral inflammation. That recovery does take place occasionally, I am satisfied both by personal experience, and by the testimony of others who have watched and noted cases in point, but, when the delirium is violent, and of long continuance, the result cannot be otherwise than doubtful. Whether recovery does ever occur when the delirium is dependent upon cerebral inflammation, it is impossible from experience to decide, inasmuch as convalescence itself forms a bar against our only source of positive information. But if, in any case accompanied by symptoms of active cerebral disturbance, no cardiac or pulmonary disease should be detected, it would be right, *cæteris paribus*, to speak more decidedly as to an unfavorable issue, than if the stethoscope had revealed mischief within the chest.

The following instructive case, which fell under my observation in St. George's Hospital, affords a good example of the class of cases in which, and of the circumstances under which, rheumatic delirium is most liable to occur, as also of the train of symptoms by which it is accompanied.

Harriet Keating, a poor, thin, over-worked girl, æt. 19,¹ was admitted into the Holland Ward on the 9th of October, 1850, under the care of my colleague, Dr. Wilson. She had been seized with acute rheumatism in the year 1848, and had undergone four similar attacks since that date. Her present attack, which had been preceded for three weeks by languor, chilliness, wandering pains, and general

¹ She was a servant of all work.

uneasiness, commenced on the 6th instant with redness and swelling of the knees. On the 8th, the day prior to her admission, she had been bled to the extent of a pint with slight temporary relief, but when she was admitted, the knees and ankles were red, swollen, and extremely painful, her countenance was anxious, and she had a weak pulse of 120. On the following day she was decidedly worse; her countenance was more anxious, she was complaining of excessive pain in the limbs, and had experienced several fits of shivering. On the 11th, after a restless and sleepless night, during which the inflammation shifted to the right wrist and elbow, she presented symptoms even more alarming than on the previous day. Her face was flushed, and, though no distinct murmur could be heard accompanying the heart's sounds, the pulse had risen to 130, and was sharp and somewhat irregular. The morning of the 12th found the inflammation again shifted to the inferior extremities, her face more flushed, the pulse quicker, sharper, and more irregular, and the heart's sounds accompanied, or rather masked, by a loud to and fro sound of friction. The treatment up to this time had consisted of lemon juice, with occasional doses of opium or morphia, but twelve ounces of blood were now taken from the arm, and she was put upon calomel and opium, whilst leeches and mustard poultices were applied to the chest. By the 20th she was greatly relieved; she had passed a tolerably good night; the dulness on percussion in the præcordial region had greatly decreased, the heart's sounds were clearer and louder, and no sound of friction could any longer be heard except quite at the base of the heart. But on the 21st there was some return of catching pain in the left mammary region, and the stethoscope revealed incipient endocardial inflammation. Eight leeches were, therefore, again applied

to the region of the heart, while the mercury was continued as before. Nevertheless, an intense systolic murmur, audible both at the apex and the base of the heart, was shortly developed, the pulse increased in frequency, her face again became flushed and the countenance extremely anxious, so that, on the 25th, it was judged expedient to take eight ounces more blood from the arm. Still the mischief continued, and, as by the 27th her mouth had become slightly affected by the mercury, the pills were omitted, and a third of a grain of tartar emetic was given every four hours, and a blister applied to the chest. After two more nights of extreme restlessness, a new train of symptoms presented themselves. Her pupils became exceedingly dilated, the eyes rolled wildly, and she was greatly excited in her manner. As the pulse was quick and weak, and jerking, the antimony was omitted, and half a grain of the acetate of morphia was given twice a day. On the 30th it was repeated every six hours. In the evening of that day, furious delirium supervened, and was accompanied on the following day by violent tetanic spasms, which gave rise, among other actions, to firm clenching of the fingers. In spite of morphia and digitalis, which were now given in full doses every four hours, and of calomel, which was again administered freely with the view of arresting the progress of the endocarditis, whilst ice was kept applied to the head, the delirium continued incessant up to the 6th of November, when she seemed thoroughly exhausted and lay motionless on her back, with the pupils exceedingly dilated, her mouth open, the tongue half protruded, dry, and brown, and the pulse rapid, feeble, irregular, and intermittent. Indeed, she appeared to be sinking; but she was made to swallow some strong beef tea, and was given half a drachm of Hoffmann's æther, and a quarter of a grain of morphia. Under the

influence of this medicine, which was repeated every three hours, symptoms of improvement soon began to manifest themselves. The pulse rallied, and again she began to talk and rave. By the 10th, however, the delirium had greatly subsided, and she had obtained a few hours' sleep. By the assistance of bark, which was now administered as well as morphia, the improvement was fully sustained. On the 13th, wine was given in addition to the medicine, and, again, a marked improvement was observed. She became more tranquil and less flushed, the pulse became gradually steadier and fuller, and the heart's sounds clearer. By the 15th, a slight systolic valvular murmur alone remained; the pulse had fallen to 100, and was soft and regular, the tongue was moist and almost clean, and her appetite tolerably good. But her mental faculties had not yet regained their proper balance. She would protrude her tongue when bid to do so, but she talked incessantly and incoherently, and oftentimes sang snatches of various songs strung together in an unconnected manner. In this half-maniacal, half-idiotic state, in which she was at times so violent as to require a strait-waistcoat, and at others was only troublesome and mischievous, she remained until the 24th, when, after a good night's rest, she became, for the first time, decidedly more tranquil. By the 27th, under the influence of a nourishing diet, and the continued use of stimulants and sedatives, she had so far improved that, although still excitable and strange in her manner, she was allowed to dress and get up during the day, and from this time her progress towards recovery was steady. On the 14th of December she left the Hospital to go for a short time to the Sanatorium at Carshalton. A slight systolic murmur, most audible towards the apex of the heart, alone remained to tell the tale of her fearful cardiac seizure; she

no longer suffered any pain or uneasiness in the region of the heart, and, although weak, she was daily regaining strength.

How beautifully does this case illustrate and explain the nature of the delirium in many of these instances ! And how suggestive is it of the appropriate treatment ! A poor, thin, ill-conditioned girl, exhausted by work, and weakened by the occurrence of four attacks of rheumatic fever, within the short space of two years, is bled to the extent of a pint for the relief of symptoms occasioned by a poison engendered in the system by faulty assimilation. What so likely to augment the mischief, to impoverish her blood, already poor and deficient in coloured corpuscles, and to exalt the excitability of the heart, the brain, and the system generally ! As might have been expected, the heart, damaged, as it were, and rendered irritable by the withdrawal of its natural and necessary stimulus, became unusually susceptible of morbid influences, and succumbed under the irritation of the rheumatic poison. Pericarditis commenced, and, for the relief of that inflammation, it was judged expedient to abstract more blood, and employ other active and depressing remedies. Their influence on the local action was soon beneficially exerted, and the inflammation was checked. But ere long it broke out in a new quarter. No sooner was the pericardial inflammation subdued, than endocarditis commenced with extreme violence ; with such severity, indeed, that it was again deemed necessary to have recourse to leeches and general bloodletting, and to recommence the administration of lowering medicines. Again the beneficial influence of the remedies over the course of the cardiac mischief was clearly manifested, but the brain began to sympathise with the general distress ; it had sustained its functions in spite of the attack of pericar-

ditis, and for eight days after the invasion of endocarditis, but it gave way at length under the extreme disturbance which its nutrition had undergone. The blood which supplied it had long been vitiated and impoverished; the heart which circulated that blood had been rendered incapable of performing its work properly by an attack of inflammation, both on its external and internal surface; a large quantity of the blood, which, vitiated as it was, had been the only source of nourishment to the nervous centres, had been withdrawn with the view of arresting the rheumatism, and checking the progress of the cardiac inflammation, and medicines of a most depressing character had been freely administered for the same purpose. No wonder that, under such a combination of circumstances, the cerebral structures should have exhibited some token of deranged function. At first, slight wandering only was observed at night, together with wildness of manner and expression, but this was speedily followed by active delirium, and by more or less convulsive action. Morphia and digitalis administered freely, and the constant application of ice to the head, failed utterly in affording relief to these symptoms, as did also calomel in full and repeated doses. After a time, however, it became obvious that the symptoms were referable to "excitement without power,"¹ and morphia was therefore resorted to again in combination with sulphuric æther. The stimulant in combination with the sedative at once effected what the latter, by itself, had proved incapable of doing. The brain had long been subjected to depressing influences, and required its failing energies to be roused, as well as its abnormal irritability

¹ This expression, which serves admirably to explain the real nature of the symptoms, was first applied, I believe, by Dr. Gooch, to a peculiar form of puerperal mania.

subdued and tranquillized, and as day by day this was more fully effected by means of nourishment, stimulants, and sedatives, it became apparent how great was the benefit derived. The brain gradually reassumed more and more of its healthy functions in proportion as the pulse betokened a return of power.

Without entering largely into the detail of cases which in their repetition can serve no practical end, I will briefly narrate such particulars of one or two as may tend to throw light upon the subject of rheumatic delirium, and to illustrate some of the facts already mentioned. And first, in regard to the rarest of all forms of head affection occurring in connection with rheumatism, that, namely, in which the brain or its membranes are inflamed.

A man who had long suffered from rheumatism was admitted into St. George's Hospital, under the care of Dr. Seymour, with his joints inflamed and swollen. One day his knees, which had been greatly swollen, became very much smaller and flaccid, and, coincidently with the subsidence of the swelling, he complained of pain in the head, became paralysed on one side, and expired in the course of thirty-six hours. On opening his body a large quantity of greenish-looking purulent matter was found smeared over the greater part of the surface of the left hemisphere, and there was considerable effusion into the ventricles.¹ So, also, in a case of Dr. Watson's. A female patient, who had rheumatic fever and subsequent cerebral symptoms, died in the Middlesex Hospital; and upon examination of the brain, unequivocal pus was found smeared over the hemispheres.² So, again, in a case reported by Dr. Fife, of Newcastle-

¹ Dr. Seymour's Clinical Lecture. 'Medical Gazette,' vol. xix.

² Quoted in Dr. Todd's Lumleian Lectures, for 1850.

upon-Tyne.¹ The patient, a man 36 years of age, after suffering for some days from acute rheumatism, was seized with delirium and unequivocal symptoms of cerebral inflammation. Life continued for five days longer, and throughout that period there was either muttering delirium or a state of perfect coma. On the fifth day, at noon, he died ; and dissection showed the membranes of the brain covered with lymph and pus, the vascularity of the brain enormously increased, and the lateral ventricles distended with serum—sufficient indications of true inflammation.

In these three cases, and indeed in all similar instances of which I can find records, the cerebral inflammation does not appear to have been a *simple* extension of the disease, but to have been excited by the concentration of the rheumatic virus upon the brain in consequence of the sudden subsidence of articular inflammation.

Inflammation of the brain, however, as already stated, is a rare accompaniment of acute rheumatism ; the head symptoms observed in the course of that disease being more commonly symptomatic of pericarditis, endocarditis, or acute pleurisy. Two of the cases, (Nos. 1 and 3,) the outlines of which are given in a former chapter,² afford an illustration of this important fact, as do also many cases which others have put on record. Thus, one of the children of Christ's Hospital, who was suffering from acute rheumatism, was attacked, on the third day of his illness, with delirium and convulsions. The attack was sudden, with great heat of skin and frequency of pulse, and, in the opinion of all who saw the case, it was an instance of the severest inflammation of the brain. The boy pointed to

¹ 'Medical Gazette,' vol. xxix, p. 703.

² Cap. VII, pp. 204, 206.

his forehead as the seat of pain. On the fourth day he sank into a state of insensibility and died, and upon dissection, not a vestige of disease was found within the cranium, but the heart was exclusively the seat of mischief, and no other part of the body exhibited the slightest morbid appearance. The disease of the heart was not confined to its investing membrane. It was the most intense inflammation pervading the pericardium and the muscular structure.¹ So, again, Dr. Richard Bright reports of a young man whom he attended in the year 1836. He had been suffering from acute rheumatism six days, when spasmodic symptoms appeared, increased rapidly in severity, and were shortly accompanied by delirium. This ultimately became so violent that it was found necessary to put the unfortunate sufferer under restraint. He died at the expiration of three weeks, and on dissection the brain was found perfectly healthy, and the pericardium and endocardium presented unequivocal signs of recent active inflammation.² Dr. Watson has placed several cases on record, in one of which the endocardium alone was the seat of inflammation.³ In another, a girl, 17 years of age, after suffering from acute rheumatism between two and three weeks, became so furiously maniacal that it was found necessary to confine her by means of a strait-waistcoat. She continued in the same state until she died; yet the brain was found perfectly healthy, and the only discoverable organic lesion was in the pericardium, which was universally coated, on its internal surface, by a thick layer of recent lymph.⁴ Dr. George

¹ The particulars of this case are detailed by Mr. Stanley, in vol. vii of the 'Medico-Chir. Trans.'

² 'Medico-Chir. Trans.,' vol. xxii.

³ 'Medical Gazette,' vol. xvi, p. 93.

⁴ 'Practice of Physic,' ed. 1, vol. ii, p. 276.

Burrows and Dr. Todd have also met with cases in point. The former tells us of a shop-boy, who, after seven days' illness, expired in a state of restlessness and delirium, and upon examination of the body the pericardium was found covered with a network of recent lymph, whilst "upon the anterior surface of the left ventricle of the heart, there was a white spot about a quarter of an inch in diameter, which appeared to be formed by concrete pus."¹ The latter reports that a young woman, after suffering for some days from rheumatic fever, was seized with delirium, and in a few hours afterwards had a convulsive fit, succeeded by coma and death; yet the closest examination of the parts after death, whilst it exposed extensive inflammation of the pericardium, could not detect a trace of inflammation of the brain, which, together with its membranes, were unusually pale.²

The third class of cases, or those in which rheumatic delirium is unaccompanied by internal local inflammation, are of much rarer occurrence, inasmuch as when the constitutional derangement is so great as to occasion disturbance of the nervous centres, the rheumatic poison is present in large quantity, and usually gives rise to cardiac inflammation. But, though comparatively rare, they do sometimes occur. Dr. Todd has made mention of some, and I have myself seen eight, in which slight wandering or delirium has arisen, and has continued for several hours, although the stethoscope has failed in detecting the slightest mischief within the chest, and the general symptoms have been inconsistent with the occurrence of inflammatory action within the cranium. One instance has lately occurred to me in which

¹ 'On Disorders of the Cerebral Circulation,' p. 188.

² Lumleian Lectures, published in the 'Lancet' for 1852.

a fatal result ensued. The patient was a gentleman, 39 years of age, who had been weakly and out of health for many months prior to the commencement of the attack. He was seized with symptoms of acute Rheumatism on the 15th of February, 1856, and I was called in consultation by my friend Mr. Kesteven, on the 22d instant, the eighth day of the attack. The patient was low and irritable, and his complaint of pain was out of all proportion to the apparent severity of the articular inflammation; but in other respects there was nothing worth noting until the 26th instant, when, after forty-eight hours of almost entire sleeplessness, he became more than ever restless, tremulous, and excited. These symptoms passed off in the morning of the 27th, but, in spite of opium, reappeared with increased violence towards evening. On the 28th, he was sensible when spoken to, but restless and excited to the highest degree, talking incessantly, moving rapidly about in bed, and using his hands to pull himself up, in utter disregard of the swollen and painful condition of the left wrist joint. His head was not hot, and he declared that it was and ever had been perfectly free from pain. Occasionally he could see only half of any object at which he was looking; his pupils were much dilated, but acted under the stimulus of strong light; the pulse was rapid, feeble, and fluttering, the tongue dry but not much coated. His heart, which had been examined daily, and twice a day, still remained perfectly free from mischief. Diffusible stimulants and sedatives were given, but without effect. With the approach of evening, the symptoms of excitement again increased, he could with difficulty be kept in bed, and he talked incessantly and in a most incoherent manner. About 12 p.m. the restlessness subsided, he became calm and collected, said he felt he should die, called for his wife and children,

and gradually expired about half-past one in the morning of the 29th. My friend Mr. Pyle, of Oxford Terrace, Hyde Park, has favoured me with the particulars of another case. A gentleman, whilst labouring under symptoms of acute articular rheumatism, became affected by tetanic spasms, opisthotonos, and convulsions. Delirium of a violent character supervened, and the unfortunate sufferer could with difficulty be kept in bed. Nevertheless, Dr. Latham and Mr. Pyle, who both examined him daily by the stethoscope, failed in detecting anything abnormal in the condition of the heart, the lungs, or the pleuræ, and were both persuaded, from the character of the accompanying symptoms, that no inflammation had been set up in the brain or spinal cord. In all the cases alluded to, the patient's recovery, or the absence of post-mortem investigation, has rendered it impossible to obtain more than presumptive proof of the non-existence of internal inflammation; but cases are occasionally met with, in which the effects of cerebro-spinal irritation are manifested by furious delirium and violent spasmodic action, terminating only with the patient's life, and in which, therefore, it is possible, by a post-mortem examination, to obtain positive evidence as to the absence of carditis, and of every other form of internal inflammation. Such a case occurred at St. George's Hospital, in the year 1850. It has been already referred to in a previous chapter;¹ but the inferences deducible from it are of such importance, that I do not hesitate to give it in detail.

Ann Amess, æt. 21, servant of all work, who had suffered from slight rheumatism a year before, was seized, on the 17th of January, with wandering pains in the limbs,

¹ Cap. VII, p. 217.

accompanied by redness and swelling of the joints, for which she put herself under medical treatment on the 19th. On the 24th, she was admitted into Pepy's Ward, under the care of my colleague, Dr. Bence Jones. There were redness and swelling in some of her joints, with excessive pain in all, and she was complaining of a catching pain in the cardiac region. Her face was exceedingly flushed, and her pulse quick, but by no means sharp. A soft systolic murmur, which increased in intensity in the course of three days, was audible over the base of the heart, but this, from its position and the direction in which it was heard, was regarded as having an anæmic origin. In short, no evidence could be obtained of mischief within the chest. The perspiration was most profuse, and, on the 27th, a crop of miliarial vesicles appeared upon the chest. No other symptom worthy of note presented itself, until the evening of the 31st, when the nurse observed that the patient was restless, and rather flighty and delirious. These symptoms subsided in the morning, but only to reappear on the following evening with increased violence and obstinacy. They did not now subside towards morning: the dawn of day showed her restless, tremulous, and excited, and, with the approach of evening, she became still more excited and delirious. Morphia had been given in vain; and laudanum, in full doses, was now resorted to, with the view of tranquillising the nervous centres: but the head symptoms rapidly increased in severity; she became violently delirious, so that she had to be held in bed; she then lapsed into a state of coma, and expired on the morning of the 3d of February. When coma supervened, Mr. Hammerton, the resident medical officer, bled her to six ounces, and the blood was neither buffed nor cupped.

After death dissection showed the brain and its mem-

branes rather drier than usual, but without any other remarkable appearance; the lungs congested, but otherwise healthy, and the pleuræ adherent here and there to the parietes of the chest by old and firm adhesions, but exhibiting no trace of recent inflammation. The pericardium contained about two ounces of serum; *the heart and its valves were perfectly healthy,*¹ its right cavities contained fibrinous coagula. The peritoneal cavity contained a small quantity of turbid serum. The liver and pancreas were healthy; the spleen soft and flabby; the kidneys slightly congested, especially the right, but perfectly healthy in appearance. The synovial membrane of both knee-joints was highly vascular, and their cavities contained a quantity of turbid, yellow serum, in which masses of lymph were floating.

Here, then, is a remarkable case in point. The patient was a servant of all work, who, as I am informed by my colleague, Mr. Keate, who sent her into the hospital, had been sitting up at night for some time, engaged in nursing an invalid. He told me, when she was first admitted, that she was much exhausted by her labours; and the loud anæmic murmur which was heard throughout the attack, and the crop of sudamina which very shortly appeared, attested the correctness of his judgment. Then came the delirium, indicative of the irritability consequent on that exhaustion; and in direct corroboration of the evidence

¹ Such at least is the record of the *post-mortem* appearance preserved by our Curator, in the Museum of the Hospital, and it serves to show the extent of "the *very slightest roughness*" which in the record of the same case, in the 'Transactions of the Pathological Society,' is mentioned, as having been observed at one spot on the surface of one of the auricles. There was not the slightest injection of the pericardial membrane.

afforded by the symptoms, the blood drawn from the arm was neither buffed nor cupped. After death the chain of evidence was completed. The brain and its meninges, the lungs and their envelopes, the heart and its membranes, both external and internal, were closely and carefully examined, but no trace of inflammation could be found, and the fact became apparent that the symptoms observed during life were due to the morbid blood acting upon nervous centres, rendered more than usually susceptible of irritation by the exhaustion to which the patient had been subjected. The delirium was obviously referable neither to congestion nor to inflammation, but to excitement without power.

In illustration of the severity which *spinal* symptoms may assume in connection with acute rheumatism, the following very remarkable case may be cited. A boy, 16 years of age, was admitted, under the care of M. Bouillaud, suffering from severe cramps and tetanic spasms, affecting almost every part of his frame. It appeared that he had been attacked with acute rheumatism about a fortnight previous to his admission; convulsive contraction of the fingers, after a time, supervened; and, subsequently, tetanic spasms commenced in various parts of the body.

When first seen by M. Bouillaud his countenance was most anxious, his eyes were fixed, and the pupils dilated. His intellect was unobscured, but the voice was rendered trembling by the constant sobs called forth by the severity of the cramps in his limbs. No part of his body was free from pain. The mouth could hardly be opened, so firmly and spasmodically was it closed; his fingers, arms and fore-arms, toes and feet, were violently contracted, and the muscles of the abdomen, no less than those of the extremities, were hard as stone during the spasms. Added to

all this suffering was a constant sense of suffocation. In spite of general and local bloodletting, together with warm-baths, and the internal administration of opium, the attacks of spasm recurred continually; symptoms of trismus became more urgent and distressing; the least attempt to swallow very greatly aggravated his suffering; and he died, exhausted, on the tenth day from the first appearance of spasms in the fingers.

The spasms had been regarded as symptomatic of inflammation of the spinal cord, but dissection revealed an injected condition of the pericardium, and within its cavity about two ounces of pure creamy greenish pus, whilst in the brain and its meninges, a slight congestion only was observed, and in the spinal cord and its membranes there was no unusual appearance beyond a small circumscribed spot of softening at the superior enlargement of the cord.¹

Death, however, is not a necessary consequence of cerebro-spinal irritation, and, therefore, however alarming the symptoms, our prognosis should be extremely guarded. I have already narrated the particulars of one case² which fell under my own observation, in which recovery took place under circumstances which almost precluded the possibility of such an event; and an equally favorable issue occurred in another case which came under the care of Dr. Edward Dewees, at the Coventry and Warwickshire Hospital. A young woman, æt. 19, was attacked, on the 12th of January, with feverishness, accompanied, on the following day, by redness and swelling of various joints, and by other characteristic symptoms of acute rheumatism. She manifested no untoward symptom until the 17th, when her heart gave

¹ Bouillaud's '*Traité des Maladies du Cœur*,' tom. i, p. 333.

² Page 296, of this *Treatise*.

tokens of commencing inflammation, and she became restless, talkative, and flighty. On the 18th an exocardial friction-sound was heard, as was also a loud systolic murmur; and altogether she was much worse. She had not slept, and "she was so violent, that it required two or three persons to keep her in bed." "The right arm was in a state of constant jactitation, so that it was never still for an instant; the right leg was similarly affected, but to a less extent; at times, however, this state became aggravated into one of general convulsions of a tetanic character." She continued in the same maniacal condition for *nine* days, during which time the convulsions continued incessantly, and she had no sleep. "On the 23d she suddenly jumped up, and fell out of bed, her forehead coming in contact with the floor." On this she became comatose, but the coma was relieved by the application of a few leeches to the head. "The treatment throughout consisted of bleeding, general and local, repeated blistering, and mercurialization;" and as soon as the system was brought fully under the influence of mercury, the severe symptoms were materially alleviated. On the 13th of February she was convalescent, the systolic murmur alone remaining.¹

Thus, then, where delirium, convulsions, and coma occur in the course of acute rheumatism, the first point to be ascertained is their connection or non-connection with any internal local inflammation. If we are unable to discover any signs of cardiac or pulmonary inflammation, and from the absence of symptoms of cerebral or spinal inflammation are led to regard the disturbance of the nervous centres as functional only, then, as in delirium tremens, or erysipelas, the invasion of head symptoms should be a

¹ 'Medical Gazette,' new series, vol. x, p. 457.

signal to support and tranquillise our patient by the administration of nourishment, stimulants, and opiates. In no case is opium, in combination with diffusible stimulants of greater service than in this atonic form of delirium; and in none is venesection more prejudicial. If, on the other hand, we detect active cardiac or pulmonary mischief, or from the presence of symptoms of inflammation of the brain, such as excessive heat of head, injection of the eye, intolerance of light, and vomiting occurring coincidentally with hardness of the pulse, and other symptoms of acute inflammation, we are led to suspect the existence of cerebral inflammation, then are we justified in having recourse to such antiphlogistic or other remedial measures, as appear called for by the symptoms in each particular instance. In such cases our efforts should be directed to the speedy subjugation of those actions going on within either the chest or the cranium, which experience has proved to be intimately connected with the occurrence of cerebro-spinal symptoms, and on the cessation of which it teaches us to believe we may reasonably expect their subsidence. But as it is notorious that venesection and other depletory measures have a tendency to reduce the proportion of red corpuscles in the blood,¹ and to produce a condition favorable to the development of delirium and

¹ See *Note*, p. 85, of this Treatise. MM. Becquerel and Rodier, after analysing their experiments, as to the effect produced by venesection on the blood, sum up by stating, "in short the effect of venesection is to cause a great diminution of the corpuscles." (Simon's 'Chemistry,' vol. i, p. 250.) In confirmation of this fact, I may cite some experiments detailed in Dr. Todd's *Lumleian Lectures* for 1850. "A large and well-nourished dog, apparently in perfect health, was fed daily on two pounds of meat and a quart of milk. He was bled on four successive days, to the extent of six

convulsions, we should be exceedingly cautious in having recourse to their employment, lest by still further impoverishing the blood, and impairing the powers of the constitution, we seriously endanger our patient's recovery. In cases marked by evident symptoms of cerebro-spinal *inflammation*, it may be necessary to have recourse to blood-letting; but if in ordinary cases of rheumatic carditis the expediency of venesection is questionable, much more so is it in those where the nervous centres are irritable, and are suffering from the effects of malnutrition, arising from an altered condition and an irregular supply of blood. Even local depletion, though sometimes expedient in such cases for the relief of active local inflammation, should be seldom practised to any great extent. We should rather endeavour to support our patient, whilst aiming at the relief of

ounces each day, and the blood carefully analysed. The blood drawn on the first bleeding, on the 6th of April, contained in 1000 parts—

142·85 Corpuscles,
2·45 Fibrin,
783·79 Water.

That on the second bleeding, on the 7th of April, exhibited a diminution of the corpuscles, and an increase of the water to—

113·54 Corpuscles,
4·72 Fibrin,
810·89 Water.

On the third bleeding, on the 8th of April, the corpuscles had again diminished, and the water increased to—

110·58 Corpuscles,
4·34 Fibrin,
815·18 Water.

And on the fourth bleeding, there were found—

106·96 Corpuscles,
3·99 Fibrin,
813·04 Water.

the more urgent symptoms, by means of blisters, mercurials, diuretics, and opium. We should economise strength by administering opium in doses sufficient to relieve the pain and tranquillise the excited nervous centres, and at the same time support the fading powers of the system by means of a nourishing and stimulating diet. Thus we may check the tendency to death, and give our remedies time to play their part. By degrees as the cardiac inflammation is subdued, the fluid effused into the pericardial sac is re-absorbed, and the heart gradually acquires greater freedom of action. Coincidentally with this improvement in the centre of circulation a corresponding improvement is effected in the blood by the gradual elimination of the rheumatic poison, and thus the irritability of the nervous centres is lessened, and the symptoms gradually subside. One exception only exists to the full, though cautious exhibition of opium. I refer to those instances in which there is a tendency to the supervention of coma. In such cases opium is not only useless, it is decidedly prejudicial to the safety of the patient, who requires a more than usual amount of support and stimulus.

Thus much then for those affections of the nervous system, which, from time to time, arise in the course of acute rheumatism, and cannot but prove a source of perplexity and anxiety.

Another complication which adds greatly to the danger attendant upon this disease, is inflammation of the lungs and their membranous coverings; inflammation attacking sometimes one, sometimes another part of the pulmonary structure, sometimes invading all parts simultaneously, producing dyspnœa, suffocation, and death. "Such forms of pulmonary inflammation are portentous ingredients in the clinical history of acute rheumatism, and give a fearful

interest to it,"¹ and they are the more formidable from the fact that they generally coexist with inflammation of the investing membrane of the heart. In some instances, the pulmonary inflammation may be excited by simple contiguity of the affected structures, but more generally, whether the attack be bronchitis or pneumonia, or whether it assumes the form of pleurisy, it is due to the same cause of irritation, the same morbid agent which excites the articular and the cardiac affections.² Hence its appearance is fraught with unusual danger. For, as the primary cause of inflammation is diffused throughout the blood, and consequently comes in contact with every part of the pulmonary tissue, inflammatory action is no sooner excited than it spreads with fearful and life-destroying rapidity, and as its cause is persistent, so its course is obstinate and little under the control of medicine. "Whichever disease occurred," says Dr. Latham, "it always put on a serious character, either from the mere magnitude and extent, or from the force of morbid action, or from the stage at which it ultimately arrived. In the four instances of bronchitis, the affection was no mere catarrh, but an inflammation largely diffused through both lungs, producing deep oppression and dyspnœa. Of the two pleurisies, one was single and the other double. The single pleurisy produced a large effusion into one side. The double pleurisy produced a double hydrothorax. Of the 18 instances of pneumonia, in 9 the disease was of one lung, and in 9 it was of both."

My experience at St. George's Hospital tallies very closely with that of Dr. Latham at St. Bartholomew's. He has reported some form of pulmonary affection in 24 out of

¹ Latham's 'Clinical Medicine,' vol. i, p. 162.

² See note at p. 157 of this Treatise.

136 cases of acute rheumatism, or, in other words, in 1 out of every 5·6 cases, and of the 246 cases of acute rheumatism which were admitted during the time I was medical Registrar, 41, or exactly 1 in every 6, were complicated by some form of pulmonary inflammation. Among the cases which were uncomplicated by recent cardiac affection, 7 instances only of pulmonary inflammation were observed; among those which were complicated by recent endocardial affection alone, 8 examples were noted: among those accompanied by pericarditis alone, 7: and among those accompanied by endo-pericarditis, 19 occurred. In other words, some pulmonary affection of an inflammatory nature was observed,—

In 7 out of 127 ¹	or in 1 out of every 18·1	cases uncomplicated by recent cardiac mischief.
„ 8 „ 80 ¹ „ 1 „	10·0	cases complicated by recent endocardial affection alone.
„ 7 „ 12 „ 1 „	1·7	cases complicated by exocardial inflammation alone.
„ 19 „ 27 „ 1 „	1·4	cases complicated by endo-pericarditis.

In the first class of cases, the affection was in six instances bronchitis, in one pneumonia.

In the second, it was twice bronchitis, four times pneumonia, and twice pleuro-pneumonia.

In the third, it was partly bronchitis, partly pneumonia in four instances, pleurisy in one instance, and partly pneumonia, partly pleurisy in the remaining two.

In the fourth, it was bronchitis in one instance, pneu-

¹ The numbers 127 and 80 each include 5, or half of the cases in which the date of the mischief was uncertain.

monia in ten instances, pleurisy in three, and partly pneumonia, partly pleurisy in the remaining five.

In almost all the fatal cases of carditis, either pleurisy or pneumonia, or pleuro-pneumonia, were present.¹

Formidable, however, as these numbers are, the proportion of cases in which pulmonary inflammation has arisen in acute rheumatism, has been even greater in the experience of others. Thus Dr. John Taylor, of Huddersfield, reports that of 11 cases of rheumatic pericarditis, pleurisy was found in 5, and pneumonia in 5. In 4 of the latter there was pleurisy as well.²

The physical symptoms of rheumatic inflammation of the lungs and pleura, are such as are met with in ordinary pneumonia and pleurisy, and therefore need not be dwelt upon more particularly, nor is there anything beyond the severity and intractability of the disease, which calls for especial notice. But in a diagnostic point of view, there is much which demands our serious attention. Cases not unfrequently occur in which no external rheumatism exists, and in which, nevertheless, the whole train of symptoms are doubtless attributable to the irritation of the rheumatic poison. Just as cardiac affection may occur as the *first*, and, for some time, the *only* local symptom of rheumatism, so, also, I am persuaded, may bronchitis, pneumonia, and pleurisy. The cases referred to are usually characterised from the first by a red coated tongue, profuse acid perspiration, and by the strong empyreumatic odour of rheumatism; and these symptoms are sometimes so striking, that on two instances they have enabled me to predict the

¹ For illustrations of this fact see Cap. VII, pp. 204–219, of this Treatise.

² ‘Medico-Chir. Trans.,’ vol. xxviii, p. 514.

accession of a well-developed attack of articular rheumatism.¹ And although the evidence of a rheumatic origin is seldom so strongly marked as in these instances, I am convinced by the effect of treatment in several suspicious cases, that the irritation of the rheumatic poison is a much more frequent cause of pulmonary inflammation than is generally supposed, and that its influence cannot be safely disregarded. For in the treatment of rheumatic inflammation of the lungs, whether accompanied or unaccompanied by articular pain and swelling, it must ever be borne in mind that the symptoms arise from no common local cause of irritation. The mischief of which they are mere exponents, is excited and kept up by a cause in its nature persistent, and, indeed, coexistent, with the duration of the rheumatism, and although we may modify the local action by remedies addressed to the relief of inflammation, yet to arrest the progress of the disease, means must be had recourse to calculated to promote the neutralization and elimination of the rheumatic virus, which is at once the source and mainte-

¹ A case of this sort has recently occurred to me in the person of Thomas Comber, who was admitted into the York ward of St. George's Hospital, under my care, on the 2d of February, 1856, labouring under acute pneumonia. From the very commencement of his attack, he was literally bathed in profuse acid perspiration, emitting the peculiar odour of rheumatism, and his tongue was excessively red and coated. So marked were these symptoms, that I questioned him as to the existence of rheumatic pains, and pointed out to the pupils the peculiar character of the symptoms, as indicative of the probable source of the attack, and as calculated to influence the treatment. Throughout his sojourn in the hospital he had no external symptom of rheumatism, but within three days of his discharge he was attacked with acute rheumatic swelling of the joints, and was readmitted into the hospital on the 16th of March, under the care of Dr. Bence Jones, suffering from a well-marked attack of acute rheumatism.

nance of the disease. And experience has proved what theory most justly leads us to anticipate, namely, that blisters and derivatives are more efficient than general venesection, and that, although local depletion and full mercurial action may be needed for the relief of excessive local action, yet that no cure can be effected without due regard to the neutralization of the poison, and the promotion of the various excretions by which its elimination is brought about. Alkalies in full doses with opium and diuretics are as useful here as in cure of the articular symptoms, and active purging by the neutral salts is also of essential service. But whilst employing blisters and the other remedies mentioned, the serious nature of the local mischief must not be lost sight of for a moment, and according as the symptoms are indicative of pneumonia, or of pleuritic inflammation, so must antimony or calomel be administered.

In rheumatic pleurisy, however, as in rheumatic pericarditis, it is necessary to observe the greatest circumspection in the employment of lowering treatment ; the patients are often pale and exsanguine, and their strength is taxed to the utmost, not only by the long duration of the disease, but by the want of sleep and excessive perspiration which usually attend it. And if under these circumstances unnecessary depression be induced by over activity in the treatment, a healthy lymph-effusing inflammation may take on an unhealthy pus-generating character.

The following cases may serve to illustrate the violence of, and extreme danger attendant upon, inflammation of the pulmonary structures when occurring in the course of acute rheumatism—

Fred. Ford, aged 32, came under my care at St. George's Hospital, on the 16th of November, 1850, suffering from acute rheumatism of four days' duration, principally affect-

ing the right hand and elbows, which were red, tumefied, and extremely painful. He appeared to have been going on well until the morning of the 19th, when he began to complain of catching pain on the left side of the chest, his pulse became sharp, and his countenance expressive of anxiety. Auscultation revealed a loud systolic mitral murmur, as also pleuritic friction and ægophony at the seat of pain. He was a thin and sickly person, a working tailor by trade, and three times a-day had been taking, by my orders, a nitre draught, with fifteen minims of Colchicum wine, ten drops of Laudanum, and a drachm of the Potassio-Tartrate of Soda. Directly he began to exhibit symptoms of pulmonary and cardiac inflammation, twelve leeches were applied to the seat of pain, and their application was followed by a blister; and to the draught were added, twenty minims of Antimonial wine, and a drachm of Tartarized Soda; at the same time, a pill was ordered to be taken every six hours, containing three grains of Calomel and one of Opium. The leeches-bites bleed freely, the blister did its duty well, and within three days he was brought under the influence of mercury; nevertheless, the inflammation continued, modified perhaps in its course, until the whole of the left side of the chest was dull on percussion, and ægophony was audible only in the supra scapular region. Nor did the pleuritic inflammation alone proceed unchecked. Rusty coloured pneumonic expectoration bore witness to the existence of mischief in the lungs, and the stethoscope revealed fine crepitation passing gradually over the inferior third of the right lung. Five days more passed away, during which a blister was again applied, and yet there was no material amendment in the symptoms. I now became seriously alarmed for his safety, for the breathing was hurried and oppressed, his countenance anxious, and the

pulse small and faltering. The next day, however, ushered in a brighter epoch in the history of his attack. The rheumatic symptoms were rapidly subsiding, and with their cessation the more urgent chest symptoms began to disappear: the breathing gradually became less embarrassed, and the case proceeded favorably to its termination. Blisters were repeatedly applied to the chest, diuretics were given freely, and on the 23d of January, 1851, the breathing was fairly re-established throughout the chest, and my patient had got rid of his present distress, at the expense of a damaged mitral valve, and an universally (?) adherent pleura.

Cases, however, not unfrequently occur, in which, either from the extent and intensity of the pulmonary inflammation, from the fearful mischief in other organs which accompanies it, or from the depressed condition or unhealthy constitution of the patient, a fatal issue is almost inevitable. Dr. Latham has put several fatal cases on record; and, among the 16 fatal cases of which I have given abstracts in a previous Chapter, no fewer than 9 were accompanied by extensive and acute pulmonary inflammation.¹ A case of

¹ See Cap. VII, of this Treatise. Subjoined is an account of the pulmonary inflammation in the several cases.

- Case* I. Pneumonia on both sides of the chest, going on to partial hepatization of the lungs.
- „ II. Pneumonia affecting both lungs, and double pleurisy.
- „ III. Pleurisy on both sides of the chest.
- „ V. Pleurisy on both sides of the chest.
- „ VII. Pleurisy on both sides of the chest.
- „ IX. Pneumonia on both sides, pleurisy on one side of the chest.
- „ X. Bronchitis affecting both lungs.
- „ XII. Single pleurisy.
- „ XV. Pneumonia of both lungs going on to the production of grey hepatization. Single pleurisy.

this sort was admitted into St. George's Hospital on the 4th of March, 1839, under the care of my colleague Dr. Wilson. The patient, a servant maid, aged 32, by her own account, had been ill for three weeks before her admission into the hospital. She was attacked during the catamenial period by pains all over her, and shiverings, with occasional heats and sweatings. She was also sick. The pain then "fell on her chest," with *much cough and thick expectoration*. A week afterwards her wrists and knees became swollen and red." When removed into the hospital, the joints were no longer swollen, but she complained of excessive pain beneath the sternum, increased on inspiration. "On the 6th of March she was attacked by a severe rigor, the first of a long series of shivering fits, which afterwards gave place to periodical attacks of dyspnœa, in one of which the patient expired on the 26th." The body was examined on the 27th, twenty-six hours after death. There was considerable effusion into all the serous cavities of the chest: "the pericardium contained about eight ounces of fluid slightly flaked by lymph: a little of the soft yellow deposit rested on the heart: the left auricle was greatly distended by a tolerably firm coagulum: its valvular surface was beset by numerous warty vegetations, and the edges of the valve were much thickened and contracted. From the regurgitation thus effected by a dam in the blood's current, partial hæmorrhage had followed in the lungs, which exhibited many instances of the circumscribed apoplectic clot. One entire lobe was in this way closed against air. It was of peculiar interest in this case, that the warty vegetations were likewise indigenous to the right side of the heart. They were observed in great numbers on the auricular surface of the tricuspid valve, some of

them even projecting round into the cavity of the ventricle. The other viscera were generally healthy.”!

Another case, in which the pulmonary symptoms assumed an equally grave aspect, fell under my observation in St. George's Hospital in the year 1845. Frances Webster, aged 18, a thin delicate girl, whose father was a martyr to rheumatism, was admitted into the hospital on the 14th of March, under the care of Dr. Wilson. At the age of 15, whilst recovering from scarlatina, she had been attacked by acute rheumatism, and had ever since been subject, at short intervals, to wandering pains in the limbs, unattended, however, by redness or swelling. Eight days before her removal to the hospital, she had experienced rigors, followed by dyspnœa, palpitation, and catching pain in the cardiac region; and on the day before admission had begun to manifest external symptoms of rheumatism, which showed themselves by inflammation of several of the larger joints.² On admission, coincidently with redness and swelling of the joints, there existed endocardial and exocardial inflammation. There was extreme irregularity of the pulse, with extended dulness on percussion in the præcordial region. The heart's sounds were distant and muffled, and at the base of the heart were both obscured by a loud to and fro sound of friction. At the apex, however, a loud systolic

¹ See the Report, by Dr. Wilson, in the ‘Lancet’ for November 16, 1844.

² “Sometimes,” says Dr. Williams (‘On Morbid Poisons,’ p. 10), “when a poison acts on many membranes, the usual order of attack is inverted.” Such appears to have been the case in the present instance, for the heart was evidently attacked some days before the invasion of the joints.

bellows-murmur was distinctly audible. Small bleedings were resorted to, a blister was applied to the chest, and saline medicines, with antimony, were administered, whilst the system was being brought under the influence of mercury. By degrees the physical signs gave evidence of the salutary effect of the treatment employed, for the heart's sounds became clearer and less distant, the dulness in the præcordial region less extended, and the pulse steadier. At the same time the articular swellings subsided, and everything seemed to promise a favorable issue. But on the twelfth day after admission, the articular inflammation recommenced, and with it a catching pain on the right side of the chest, accompanied by pleuritic friction and ægophony, announcing the supervention of acute pleurisy. Subsequently, an attack of a similar nature commenced on the left side of the chest, and with it inflammation of the lung itself. The poor girl's breathing was now exceedingly oppressed, her powers of life were manifestly failing, and her back began to slough. Still, however, she lingered on, and even survived an attack of peritonitis which supervened a few days afterwards. But on the 27th of April a fresh attack of inflammation was set up on the left side, and she sank on the 28th, under the combined influence of her several maladies.

A post-mortem examination revealed, as was expected, a heart not greatly enlarged, but presenting a pericardium almost universally adherent, by means of recently effused lymph; a mitral valve fringed with beads and festoons of recent lymph and fibrin; a copious effusion of lymph and serum into the pleural cavity on either side; the left lung passing into a state of red hepatization; and bands of recent lymph, together with turbid serum, the ordinary

products of recent peritonitis, in the cavity of the abdomen.¹

How full of painful interest are such cases! how pregnant with hints for our guidance and instruction! No particular organ or set of organs was alone the seat of morbid action. The heart on its external and internal surface, the pleura on either side of the chest, the lungs and the lining membrane of the abdomen, the synovial membrane of the joints, the ligaments and the parts external to the joints, at once the seat of active inflammation! How widely spread must be the cause of such extended mischief! how unlike the effects of any local agency! No impartial inquirer can fail to admit the importance of such cases, no zealous physiologist to recognise and appreciate their intimate bearing on the true pathology of the disease.

One other complication of acute rheumatism is deserving of especial notice; I refer to disorganization of the joints, which sometimes ensues when the articular inflammation is stationary for any length of time. Generally speaking, the liability to this occurrence varies in inverse proportion to the number of articulations affected, but there is always just ground for anxiety, respecting the integrity of a joint, which, in spite of treatment, remains swollen and painful unusually long. I have seen so many cases of unequivocal rheumatism giving rise to acute lymph-effusing inflammation of the joints, and, in some few instances, to suppuration, that I am convinced of the necessity for the greatest vigilance in watching the progress of the articular

¹ For further particulars respecting the autopsy of this case, see the 'Abstract,' at p. 205, of this Treatise, as also the '*Post-mortem Book*,' for 1845, preserved in the Museum of St. George's Hospital.

inflammation, and taking every precaution for its speedy subjugation. When pain and swelling become fixed in any particular joint, and continue there after the symptoms in the other joints have subsided, there is always reason to fear that inflammation has taken a deeper hold than usual of the articular structures, has produced there some of its ordinary ill-effects, and if not arrested will go on to ulceration of the cartilages, and the production of a stiff joint.

The necessity for strict attention to the progress of the articular symptoms of rheumatism cannot be enforced better than by citing the particulars of one or two cases in which, during life, there has been every token of threatening articular disorganization, or every evidence after death of extensive local mischief.

Ann Stevens, a thin delicate looking girl, aged 18, became a patient under my care, at St. George's Hospital, on the 14th of September, 1850. She had been suffering nearly two weeks from acute rheumatism, principally affecting the right hand and wrist, which were swollen and inflamed. Other parts had been temporarily affected, but the right wrist had remained swollen throughout. A week passed away, and, though all pain had ceased in other parts of the body, yet, in spite of fomentations, her wrist remained as much inflamed as ever, and the pain was aggravated by the slightest motion. Still I hoped to conquer the disease by the agency of medicine addressed to the relief of rheumatism, but as, at the end of a fortnight, she had shown no signs of amendment, and mischief appeared imminent, I judged it expedient to put some leeches on the joint, and to follow their application by a blister, giving her at the same time calomel and opium. This at once alleviated her suffering; the tension of the inflamed part was relieved, the

redness subsided, and, in the course of another week, the pain and the swelling had been greatly subdued. Some pain, however, still continued, so another blister was applied, and, subsequently, in order to ensure perfect rest, her arm was placed on a splint, and the wrist was blistered as before. This completed what the first local applications had effectually begun; the pain subsided, and there remained only thickening of the parts about the joint, and some effusion, probably of thickened synovial fluid, within the capsules. This was, after a time, removed by absorption, under the influence of the compound Iodine lotion, and she was discharged on the 16th of November, very little stiffness of the joints remaining.

So also, in the case of Ann Conolly, aged 17, who was admitted into St. George's Hospital, on the 25th of August, 1847, under the care of my colleague Dr. Nairne. She had been suffering one week from acute rheumatism, principally affecting the hands and wrists, and at the time of her admission, the wrist, and several of the smaller joints of the hands, were inflamed and swollen. She was greatly out of health, but under the use of purgatives, salines, and the *mistura guaiaci* of the Pharmacopœia, the pains and swellings had all subsided by the 3d of September, except those in the third finger of the left hand, and the thumb of the right hand. In those parts the inflammation continued unabated, and so obstinate did it prove, and so severe in its nature, that crepitation could at last be felt distinctly in the affected joints. In spite of blisters and mustard poultices which were repeatedly applied, of colchicum, which was administered internally, and of full mercurial action which was twice induced before the symptoms were entirely subdued, the poor girl was not in a state to leave the Hospital until the 3d of November, when *she had very*

little motion in the thumb, and her finger was anchylosed in a bent position.

Some cases, however, do not issue so favorably; the patient sinks either from the irritation of the articular inflammation, or from the concurrence of some serious internal complication. In such cases there has been found every stage of acute articular inflammation, from simple congestion to extreme capillary injection of the affected parts, with effusion of lymph and pus. In the case of the young girl already referred to (p. 307) as having been complicated by active delirium, "each knee-joint contained rather more than a drachm of turbid glutinous serum, which was alkaline, highly albuminous, containing many oil-globules and cells the size of pus-globules, having well-marked nuclei, and of a specific gravity greater than the albuminous liquid. Some cells were also seen three times as large as those containing granular matter and nuclei.

"In the upper part of the cavity of each joint, *a thickish mass of fibrin an inch and a half broad, and about the same length, was lying.* One of these masses was deeply stained with red blood, but no vessels could be traced in it. On removing these substances *the synovial membrane at the upper part of each joint was seen to be intensely red, and highly vascular,* and to present the most striking contrast to the white shining cartilage in which no vessels could be traced, and which was not altered in appearance.

"One elbow-joint was opened, and it contained a clear, glutinous, synovial fluid, apparently without any cells in it."¹

In some instances inflammation has produced even more

¹ St. George's Hospital *Post-mortem* Book for 1850, preserved in the Museum of the Hospital.

disastrous consequences, having gone on rapidly to sup-puration and complete disorganization of the joint. A case in which ulceration of the cartilages took place, has been recorded by my colleague, Mr. Cæsar Hawkins, in the 'Lancet' for August 23d, 1851; and others are to be found in the various medical journals. Within my own observation, five instances have occurred, of three of which an abstract has been already given.¹ The post-mortem appearances observed in Case iv may be taken as a sample. In that case "the right knee and the left wrist-joints were still swollen, and when cut into, were found to contain large quantities of thick, viscid fluid, mixed with lymph and pus. The sheaths of the tendons at the back of both wrist-joints contained a quantity of thick puriform fluid. The left knee-joint contained a larger quantity of synovia than natural, and the synovial membrane of this joint was slightly increased in vascularity."²

As then very serious lesions may arise from rheumatic articular inflammation, even when the greatest caution is observed, and, as such lesions are more likely to occur when the local symptoms are neglected, it behoves us to do all in our power for their relief, and to watch carefully for the earliest indications of commencing mischief. From the first, as already stated, much comfort may be afforded by the application of warm or tepid fomentations, and repeated

¹ See Abstract of Cases iv, vii, and xvi, recorded in Cap. VII. In Case xiii, a large number of pus-globules were discovered by the microscope, but as the fluid contained in the joints appeared to be thickened synovia, containing pus-globules, rather than a purely purulent or sero-purulent fluid, it is probable that suppuration was only just commencing at the time of the patient's death.

² For a detailed account of this case, with the dissection after death, see St. George's Hospital *Post-mortem* Book for 1845, p. 218.

experiments have convinced me that none prove so efficient as the alkaline and sedative solution, of which I have elsewhere given the formula.¹ When this is fairly and fully employed from the first, articular mischief will rarely if ever happen. But in such matters it is not prudent to run the slightest risk, and when inflammation attaches itself with more than usual obstinacy to any particular joint, leeches or a blister should be applied at once, and repeated, if necessary, whilst the system is being brought under the influence of mercury. By these means, and by perfect rest, which is best ensured by means of a splint, the pain will be subdued, the swelling got rid of, and the integrity of the patient's joints preserved.

¹ Page 117.

CHAPTER XI.

ON RHEUMATIC GOUT.

CLOSELY allied to rheumatism, yet presenting some of the features of gout, is that obstinate, painful, and distressing malady, which is known under the title of Rheumatic Gout.¹

¹ This form of disease has been described by Dr. Macleod under the title of "Capsular Rheumatism;" by Dr. Todd under that of "Chronic Rheumatism of the Joints;" and by Dr. Adams, of Dublin, under that of "Chronic Rheumatic Arthritis." These appellations, however, appear to me objectionable, inasmuch as they refer the local changes to rheumatism, with which they have no sort of connection. Dr. Garrod objects to the title of Rheumatic Gout, and proposes the term "Rheumatoid Arthritis." He states that we should be equally justified in calling certain cases of scarlatina, or measles, by the compound title of "Rubeolo-Scarlatina," as in applying the term Rheumatic Gout to the disease under consideration. But this is simply an incorrect view. Rheumatic Gout is not a mere variety of Gout or of Rheumatism, nor is it a compound of the two diseases; it is essentially distinct from them both, has a special pathology of its own, and requires a distinctive title. The term Rubeolo-Scarlatina could only be applied legitimately to a disease bearing a strong resemblance to Rubeola and Scarlatina, yet having a separate and independent existence. To such a disorder its application would be appropriate. On the other hand, if the term Rheumatoid Arthritis were to be employed, a due regard to our nomenclature would necessitate the disuse of the terms Gout and Rheumatism, and the substitution of the titles "Gouty Arthritis" and "Rheumatic Arthritis."

My own opinion in favour of the term "Rheumatic Gout"

Whether viewed in relation to the amount of present suffering it inflicts, or to the permanent injury and distortion it entails, it ranks among the most formidable of this class of disorders. Its symptoms are not only temporarily severe, but often lead to irremediable helplessness.

The natural history of rheumatic gout accords but little with that of true rheumatism, and is equally inconsistent with that of true gout. It differs from rheumatism in the frequency of its attacks, and the increase exhibited at each recurrence in the severity and obstinacy of its symptoms; in invading the small joints in preference to the large; in being more stationary and usually causing thickening and permanent enlargement; in never involving the heart or its membranes; and in sometimes producing desquamation of the skin. In all these particulars it strikingly exhibits a gouty nature. But it is unlike gout, in numbering among its victims the young, the middle aged, the slender, and the weakly; in attacking women more frequently than men; in invading several joints simultaneously; and in being ordinarily unattended by dyspeptic symptoms. In all these points its rheumatic nature is strongly marked. It maintains, indeed, as its name implies, a place inter-

remains unshaken. The titles of diseases are seldom used to indicate their pathology, but rather as a means of establishing their identity. In this point of view, the term Rheumatic Gout is unexceptionable. It points to the class of diseases with which the malady in question is closely allied, yet at the same time it is sufficiently distinctive, and cannot be confounded with either Gout or Rheumatism. Further, it has the great advantage of being already recognised, and extensively used. Even Dr. Garrod has deserted his favorite bantling, "Rheumatoid Arthritis," and has adopted the term "Rheumatic Gout" as the title of his book. In truth, it is a most appropriate title; and it is to be hoped the Profession will concur in limiting its application to the disease under consideration.

mediate between the two disorders; it is identical with neither, yet presents some characteristics of both, and is, therefore, well described by the popular, yet distinctive title of Rheumatic Gout.¹

In its acute, and apparently most terrible form, this disease may be confounded with acute rheumatism; but when carefully examined, its history, symptoms, progress, and terminations, all serve to illustrate its distinctive character. Referable without doubt to some constitutional peculiarity closely connected with perverted assimilation, it selects as its victims, either the weakly and unhealthy, in whom the natural excretions are imperfect or deficient, or else fixes upon those who, though usually robust, have been subjected to some cause of mental or bodily depression. It is remarkably prone to affect the children of consumptive parents;² it attacks the offspring of gouty or rheumatic persons whose health is impaired, and whose nervous energy is exhausted by the labour and anxieties of business; it fixes upon the girl just arriving at puberty, in whom the uterine functions are ill-performed; it invades the stiffening articulations of the woman who has arrived at that time of life which is marked by the cessation of the monthly periods; it shows itself during the state of debility which follows a miscarriage, or a difficult and protracted labour, more especially when the labour has been

¹ I shall presently give the reasons which have led me to believe that it is essentially distinct from true rheumatism, and equally so from true gout; that it has a special pathology, and demands a peculiar method of treatment; and that, if regarded and treated as either rheumatism or gout, it will usually run on unchecked in its course.

² Of 119 patients of whom I have made special inquiry on this subject, no less than 23, or 1 in every 5·2, had lost a parent or one or more brothers or sisters of consumption.

accompanied by flooding; it is a frequent attendant upon renal disease; upon the cachexia produced by syphilis or gonorrhœa, or neglected mercurial action; and it is a common sequel of over-long suckling, of excessive venery, of severe and long-continued mental exercise, and of mental distress and bodily exhaustion. Neither age nor sex affords immunity from its invasion; but most commonly it shows itself from the age of thirty-five onwards; and its earliest attacks are usually seen in girls whose uterine functions are suspended or ill-performed.¹

Its attack, when acute, may be ushered in by considerable fever, together with pain and aching of the joints, and, after a time, some redness may supervene, just as in a paroxysm of ordinary rheumatism. But more generally there is little external discoloration, and far less heat of

¹ In almost every instance which has fallen under my notice of its occurrence in very early life, it has been either hereditary or else connected with disordered uterine function. Within the last four years I have had under my care no less than eleven girls, under eighteen years of age, suffering from this complaint. In every instance, save one, the monthly periods were disordered. In the years 1851-2 I had two girls under my care, at St. George's Hospital, of the respective ages of fifteen and seventeen, whose joints were frightfully distorted by the disease. In the former, the menses had first appeared at the age of thirteen, but had only re-appeared three times since; in the latter, they had been absent a year and a half, and their cessation was coincident with the commencement of ill health. The first of these patients, at my earnest desire, went for four months to Bath, and returned much benefited by her residence there. Dr. Haygarth's experience also led him to connect its appearance in women with irregularity of the catamenia, for he remarks ('Clinical Medicine, p. 183), that "out of thirty-three women in whom he observed it, three only were afflicted with it during the period of regular menstruation, and of these one had suffered twelve abortions."

skin, less furring of the tongue, less bounding of the pulse, in short, less active febrile disturbance, than in acute rheumatism ; and though the skin may be moist and the urine loaded with lithates, yet the urine is less loaded than in a corresponding state of excitement from true rheumatism, and the perspiration is less constant, less sour smelling, and less profuse. But the liver usually acts more imperfectly than in genuine rheumatism, as is evidenced by the yellowness of the complexion and the conjunctivæ, the yellowness of the fur on the tongue, and the paleness of the alvine evacuations.

The form and the situation of the articular swellings present well-marked peculiarities. Whereas the larger joints most commonly suffer in true rheumatism, the small joints of the hands are the parts most frequently affected in this disease ; and when the knees, or other of the larger articulations are attacked, the character of the swelling is peculiar and diagnostic. It is more circumscribed than the articular swelling of acute rheumatism, and in its form and character indicates the existence of effusion within the joint and the adjacent bursæ and tendons, rather than into the surrounding structures. In the knee-joint this peculiarity is strikingly manifest. Whilst there is little, if any, effusion into the surrounding tissues, the synovial membrane, full and distended, may be seen projecting at those parts where the adjacent structures offer least resistance, and if the two hands be placed one on either side of the joint, fluctuation may be made perceptible to the touch. The adjoining bursæ, and the sheaths of the tendons, are also felt as circumscribed swellings. Another peculiarity is that the local symptoms are less migratory and more obstinate in their continuance, so that there is greater danger of disorganization of the joints or of thickening in their imme-

diate vicinity. Indeed, although the first activity of the articular inflammation may be subdued by treatment more rapidly than under corresponding circumstances in acute rheumatism, yet, in a subacute or chronic form, inflammatory action will often persist for months, producing permanent and irreparable mischief. Nor are the differences confined to the points already specified; they are strikingly marked in the nature of its complications. It is unaccompanied by the frightful heart-disease which proves so fatal in acute rheumatism, but it has for its attendants, inflammations of the eye, the pleuræ, and the brain.

Sometimes, however, the diagnosis between acute rheumatism and acute rheumatic gout is by no means easy. Indeed, I entertain considerable doubt whether an attack which commences as acute rheumatism, may not change its type under certain conditions of treatment or constitution, and terminate eventually in rheumatic gout. Certain it is, that I have seen several cases characterised at first by all the most striking features of acute rheumatism, by the thickly-coated tongue, the loaded urine, the bounding pulse, the profuse, acid, sour-smelling perspirations, and, moreover, by the peculiar redness and inflammation shifting rapidly from joint to joint, and affecting the larger in preference to the smaller joints, in which, after the first intensity of the attack has been subdued, a different train of symptoms has arisen. The larger joints have gradually obtained immunity from pain, but the small joints of the hands have become painful, swollen, and, in spite of treatment, permanently enlarged; the articular inflammation, though less urgent in its character, has been extremely obstinate in its continuance, and has lost its distinctive migratory character; the skin has been no longer bathed in perspiration; the urine no longer loaded; and the pulse

has changed its character, and from being full and bounding, has become soft and weak, or irritable. Thus I have repeatedly known patients crippled by unequivocal rheumatic gout, which commenced, in the first instance, apparently as a sequel of acute rheumatism. In two instances of this sort the patients, after a time, came again under my notice, suffering from well-marked rheumatic gout, which, in this second attack, had not been preceded by symptoms of rheumatic fever.

When the disease assumes a chronic form, it admits of much more ready diagnosis. Occurring sometimes after the subsidence or partial disappearance of an acute paroxysm of the disorder, but more commonly without any previous acute attack, it may commence without any remarkable febrile disturbance while the pulse is quiet, the tongue almost clean, and the urine abundant, pale coloured, and of low specific gravity. The patient's chief complaint is of languor and loss of appetite, with occasional chilliness, and pain and stiffness in the joints, which soon become swollen from effusion into their synovial cavities, and into the bursæ and sheaths of tendons immediately surrounding them. Sometimes, indeed, there are no dyspeptic symptoms, and the patient declares that nothing disagrees with him. In such cases the complexion is usually florid, the skin acts freely, the tongue is clean, the action of the bowels regular, and the urine clear; and the only noticeable indications of declining health are fretfulness or irritability of temper, with depression of spirits, coldness of the extremities, feebleness of the pulse, and pale or almost colourless urine, remarkable for the extreme lowness of its specific gravity. But more generally the complexion is sallow and the skin sluggish, and evidence of mischief is furnished by yellowness of the conjunctivæ, constipation of the bowels, a pale

and unhealthy character of the dejections, excessive flatulence after meals, turbidity of the urine, feebleness of the pulse, and slow yet steady enlargement of the joints—an enlargement which in many cases is unaccompanied by perceptible increase of local action, and appears to depend upon a process allied to slow perversion of nutrition, rather than to ordinary active inflammation. Yet so obstinate does it generally prove in its continuance, and such thickening does it produce in the periosteum covering the extremities of the bones, in the ligamentous structures, in the synovial membrane, and in the bursæ and sheaths of tendons immediately surrounding the joints, that more or less permanent stiffness and enlargement remain long after all active disease has passed away. A second or third attack brings out in relief this distinctive feature. The irritation of a poison which has been attracted to the joint for a sufficient length of time to cause effusion into the synovial membrane, and thickening of the sub-synovial areolar tissue, very seldom fails to excite more deep-seated and more serious mischief. The cartilages with which the structures in question are intimately connected, are generally implicated sooner or later. Their nutrition becomes affected, and gradual absorption of their structure takes place; and thus, after a time, the articular surfaces of the bone are left bare and unprotected. But more than this. While the ligaments which keep the extremities of the bone in apposition, are being stretched by the fluid effused within the joint, and the cartilages at the same time are gradually wasting, the extremities of the bones themselves become irregularly enlarged by expansion of their osseous tissue, and the deposit of osseous matter around the joint.¹ A

¹ "The great distinction of this process from ordinary inflamma-

material alteration is thus produced in the form, and oftentimes in the direction of the joint. The fingers, for instance, which are very prone to be affected, are drawn towards the ulnar or outer side of the hand, and take a permanently oblique direction; whilst the enlarged, and partly dislocated extremities of the bones, more especially of the metacarpal bones, project in every variety of form, and constitute the "nodosities" which have been described by Dr. Haygarth, in his 'Clinical History of Disease.'¹ Strange as it may seem, these changes in the form and direction of the joints are strikingly similar on either side of the body, each knobby enlargement on the one side, having its counterpart in the corresponding joint on the other, so that an extraordinary symmetry of arrangement is exhibited in the local manifestations of the disease.

tion, consists in this, that in the chronic rheumatic affection," as Dr. Colles has well remarked, "two very opposite processes are to be found going on at the same time, viz., absorption of the old bone and its cartilage of incrustation, with deposition of new bony matter, whilst in the ordinary inflammation there would be simply a gradual enlargement of the bone. It is worthy of remark that, in malignant disease of the joints, and in strumous affections of them, both connected with constitutional taint, there is the same tendency to the formation of exuberant osseous growths around the joints, while the articular textures within are suffering destruction and decay." (Todd on 'Rheumatism,' p. 169.) For beautiful illustrations of the changes thus produced in the joints, see the Atlas which accompanies Dr. Adam's work on Rheumatic Gout.

¹ I am glad to find my views confirmed by Professor Rokitansky, who gives it as his opinion ('Pathological Anatomy,' p. 173), that the changes in these cases are not due to simple *rheumatic* arthritis. He believes them to have more or less of a gouty origin, but I am inclined to regard them as referable to the agency of a specific poison altogether distinct from, though closely allied to, the *materies morbi* of rheumatism and gout.

In connection with this enlargement of the joints, there seldom exists any deposit resembling the chalky deposit of gout : indeed, it may be stated that no such deposit is ever found, unless at some time or another the patient has been afflicted with true gout. The first series of changes are usually confined to an alteration in the nutrition of the parts affected, which causes them to lose their natural brilliancy and elasticity, and to become thickened, opaque, and altered in colour. After a longer period of exposure to the irritation of the rheumatic element, a further alteration of structure takes place ; processes of thickened synovial membrane are seen dipping down into depressions existing around the head and neck of the bones ;¹ or a dense ligamentous substance, resulting probably from some peculiar alteration in the synovial membrane, is seen interposed between the articulating surfaces ;² or small irregularly-shaped cartilaginous bodies are found existing, either loose within the joint, or attached to it by pedicles formed of thickened synovial membrane ;³ or the opposed surfaces of the bones denuded by chronic wasting of the cartilages, and rendered smooth

¹ See Dr. Adams's articles in the 'Cyclopædia of Anatomy and Physiology,' as also the Reports of Messrs. Adams, Canton, and Prescott Hewett; in the 'Transactions of the Pathological Society of London.'

² A case illustrative of this change in the synovial membrane will be found in Sir Benjamin Brodie's 'Observations on Diseases of the Joints,' p. 11. Specimens illustrative of this morbid appearance may be seen in the Museum of St. George's Hospital.

³ For a full description of the minute structure of these bodies, see a paper by Mr. Rainey, quoted in the 'Transactions of the Pathological Society of London' for 1848-9, p. 110; also Dr. Adams's treatise on Rheumatic Gout, pp. 31-34. Some beautiful preparations, exhibiting these bodies *in situ*, may be seen in the Museum of St. George's Hospital.

by attrition upon each other, are found white, glistening, and ivory-like in appearance.¹

But in some cases, which in external appearance present many of the characteristics of the disorder I am describing, there exists a deposit, more or less extensive, of a white pulverulent matter. Sometimes this matter is deposited over the whole extent of the articulating surfaces, so that the cartilages appear smoothly incrustated by it; at others, it is sparingly sprinkled over their surface in the form of a fine white powder; at others, it is limited to a few parts only; and at others, again, it not only covers their entire surface, but pervades their structure, and fills the cancelli of the subjacent bone.² That this deposit, which analysis has shown to consist of lithate of soda, mixed occasionally with some lithate of potash, ammonia, and lime, as also with chloride of sodium, and with phosphate and carbonate of lime,³ is identical in composition with the deposit which exists in gout, and that it occurs in those cases only of rheumatic gout which in their external symptoms approximate most closely to genuine gout, is susceptible of easy

¹ This condition has been described and delineated by Cruveilhier, under the title of "Usure des Cartilages." Cases in point are recorded in Sir B. Brodie's work 'On the Joints,' ed. 4, p. 322, as also in the 'Transactions of the Pathological Society.' Specimens are preserved in the Museum of St. George's Hospital.

² See Report by Dr. Handfield Jones, in the 'Pathological Transactions' for 1848-9.

³ This was distinctly proved in some cases of Dr. Chambers', as also in a case of Mr. Stanley's, of St. Bartholomew's Hospital (reported by Sir C. Scudamore, in his work on 'Rheumatism,' p. 351), in which the deposit consisted almost entirely of carbonate of lime. Specimens of the joints are preserved in the Hospital Museum. For the result of several analyses of the ordinary tophaceous deposits, see Simon's 'Chemistry,' vol. ii, p. 477.

proof; and it does not admit of doubt that its presence in the joints is conclusive evidence of the existence of true gout at some period or another of the patient's life. But I cannot therefore admit the conclusion, that the existence of such deposit is of itself sufficient to mark such cases as examples *throughout* of true gout; for it often occurs in persons who, in their younger days, have been martyrs to rheumatic gout in its distinctive form; and it sometimes coexists with those structural changes in the joints which everybody admits to be dependent upon rheumatic gout. Thus, amongst cases which do not differ greatly from each other in their external character, there are found, in some, extensive structural alterations in the joints, but no traces, however slight, of earthy deposit; in others, the same altered condition of the articulations is accompanied by an evident, though scanty and irregular earthy deposit; whilst in others, again, the deposit is extensive, and the structural changes first alluded to, comparatively small. In the more extreme examples of the disease it is not difficult to determine whether the case be one of gout or rheumatic gout, and to predict with tolerable accuracy whether any deposit will or will not be discovered in the joints after death; but in some few instances the symptoms are of such a hybrid character as to preclude the possibility of arriving at any certain conclusion. Even dissection fails sometimes to disclose any strongly-marked difference between those cases which are, and those which are not, accompanied by such deposit; for occasionally one joint may be found smeared over with earthy matter, whilst another in the same patient, equally enlarged, presents no appreciable amount of deposit. Of this I have seen two instances; and as it is quite possible for a gouty tendency to be engrafted on an old rheumatic gout disposition, or for a rheumatic gout tendency to

arise in a gouty habit, I have come to the conclusion that in such cases, which are very rare, the disease has been at one time rheumatic gout, at another more strictly gouty in its nature, and that the difference in the results observed after death has arisen from the prevalence of each form of disease at different periods of the patient's life.

I trust it is made sufficiently clear, by the above statement, that the disease should not be regarded as of a hybrid character, or, in other words, made up in part of rheumatism, in part of gout. It is my firm conviction, that just as true rheumatism and true gout do both sometimes manifest themselves at different periods of life in the same individual, so rheumatic gout may arise in a person who either has been, or may hereafter become, subject to true rheumatism or true gout, and that it has no connection with either of these diseases, beyond that which attaches to it in virtue of its being a constitutional disorder, producing local manifestations in the joints. Not only does analysis of the blood, and of the fluid effused into the joints in these cases, when well marked and distinctive, prove the absence of lithic acid, the poison of gout, as a cause of the articular inflammation and enlargement, but the rare occurrence of any gouty deposit in the joints, in cases answering to my description of rheumatic gout, renders it manifest, even to a superficial observer, that the presence of true gouty symptoms is a mere coincidence, and by no means essential to the existence of the disease. On the other hand, analogy furnishes strong grounds for the belief that the articular mischief is not due to the presence of lactic acid, or whatever may be the *materies morbi* in true rheumatism, whilst the rapidity with which structural disorganization of the joints supervenes, even when the local action is apparently least acute, and when the general symptoms are certainly not

indicative of febrile disturbance, is a further proof that it is essentially distinct from true rheumatism, as typified in rheumatic fever, or in the ordinary chronic form of the disease. Indeed, the circumstances under which rheumatic gout occurs, the extraordinary obstinacy of its symptoms, the peculiar alteration in the structure of the joints, which forms its most characteristic feature, and the class of remedies by which it is most successfully combated, all seem to indicate a close connection with some *peculiar* constitutional taint.¹ The able researches of Dr. Gairdner² have rendered it extremely probable that true gout is in some way connected with a variation in the relative quantities of urea and uric acid in the system, and hereafter it may be discovered that rheumatic gout is dependent on some other perversion in the relative proportions of the constituents of the blood. And if this be so ; if, in short, the disease be due to a disordered condition of the blood essentially distinct in its character from that which gives rise to pure gout or to pure rheumatism, we are bound in accordance with sound pathology to separate it from the diseases it so much resembles, and with which it is sometimes intimately blended ; to trace out its peculiarities ; and to establish, if possible, by chemical demonstration, its claim to be considered a special disorder.

When the superficial joints are attacked by this disease, the symptoms already described will generally enable us to recognise its true character. But all joints are liable to its invasion, and when those which are deep-seated suffer, the diagnosis is much more difficult and uncertain. This is more particularly the case when the hip-joint is the part implicated. Local pain, or a sense of stiffness unaccom-

¹ See note, pp. 339-340.

² On Gout.

panied by heat, or by any material constitutional disturbance, is usually the first symptom to attract attention, and oftentimes considerable alteration in the joint will have occurred before steps are taken for its relief. As the disease progresses, the pain becomes more constant and severe, and is felt most acutely when the weight is thrown on to the affected joint. After a time, other symptoms arise dependent on the changes progressing within the joint. For, in the hip, as in the other joints, the disease is attended by the deposit of ossific matter around the head of the bone, with gradual wasting of the cartilages, and eburnation of the opposed articulating surfaces. And, as the bony deposits take place irregularly, the shape of the acetabulum and head of the femur is altered, as is also, not unfrequently, the position of the head, in relation to the neck of the bone. This, together with absorption of the cartilages, leads to so much shortening of the affected limb, and renders rotation of the thigh so difficult, that the patient walks lame, and presents an exceedingly awkward appearance. The nates of the affected side become flattened, and the muscles of the thigh, in some measure, atrophied from want of use; the foot is everted, and sometimes the toes only can be placed on the ground; whilst, from the difficulty or impossibility of rotating the leg, circumduction of the limb is rendered necessary.

The symptoms just described, point unequivocally to mischief in the hip, yet, as this affection is usually limited to the one hip, and rarely extends to other articulations,¹ the unwary might be led to attribute the mischief to some other and a purely local cause. But careful inquiry into the history of the case will seldom fail

¹ See 'Cyclopædia of Anatomy and Physiology,' article "Hip."

to unveil the mystery. Generally the patient will be found to have suffered from rheumatic gout at some former period ; or to have experienced pain recently in some of his other joints ; or, possibly, to have had slight temporary swelling in the knee, or in one of his toes or knuckles ; and thus a clue to the nature of the disease will be obtained at once, and may be safely acted on. Indeed such a discovery is of great practical importance, inasmuch as it often leads to the employment of remedies addressed to the relief of constitutional derangement, when otherwise the treatment might have been purely local.

The treatment required in the acute form of rheumatic gout, differs from that of rheumatism, in that, from the character of the persons attacked, it need seldom be actively antiphlogistic, and from the inflammation of the joints being more stationary, and the danger of structural disorganization greater, there is more necessity for the application of leeches, blisters, and fomentations to the inflamed parts. General venæsection is rarely, if ever, needed in this form of disease, even when most acute, and opium, as was pointed out by Dr. Corrigan,¹ is of far less importance, than in genuine rheumatism. Even alkalies are not needed in such full doses as in acute rheumatism, and when so employed, are apt to prove depressing ; but given in moderate quantity with colchicum, small doses of antimony, and alterative doses of blue pill or calomel, aided by an occasional warm or vapour bath, some mild purgative, topical applications to the joints, and strict attention

¹ "There is one form of acute rheumatism," he says, "in which the opiate treatment will cause disappointment," it is that in which, "when rheumatism does appear, it is not genuine rheumatism, but a combination of gout with rheumatism." ('Dublin Medical Journal,' vol. xvi, p. 267.)

to diet, are usually sufficient for the relief of its more active symptoms.

When speaking of the treatment of acute rheumatism, I entered fully into the consideration of all the circumstances which indicate the employment of these various remedies, and which render their use inadmissible, and I do not know that anything will be gained by a reiteration of cautions which hold good as well in this form of disease, as in that we were then considering. Colchicum¹ and alkalies are as necessary here as in genuine rheumatism, and as the chylopoietic viscera are generally sluggish, and the secretions much deranged, energetic medical interference is needed to restore them to a healthy condition. But in the administration of remedies, the greatest care should be taken not to depress the system unnecessarily; if in genuine rheumatism, this caution is needful, much more so is it here, where the disease occurs in the weakly or cachectic, and exhibits a remarkable tendency to pass into a chronic form. Whether mercury and purgatives, or colchicum be employed, care must be taken so to administer the medicines as to remedy defective secretion, eliminate the poison, and restore a healthy state of assimilation without lowering the patient, and exhausting his strength. The whole energy of his constitution may be needed to bear up against the protracted irritation arising from chronic inflammation of the joints, and even if he escape articular disorganization, nothing, in my experience, so greatly tends to endanger recovery, nothing assists so much in perpetuating the rheumatic state, as over-active and depressing treatment.

¹ In some examples of this form of disease I have found the tincture of the flowers of colchicum extremely beneficial, even when other preparations have failed.

Sometimes, however, a slightly antiphlogistic treatment seems imperatively called for, by the obstinacy of the local symptoms, and the long continuance of febrile disturbance. The cases alluded to are characterised by more than ordinary derangement of the digestive function, an unhealthy condition of the intestinal secretions, and excessive sluggishness of the liver. There is acidity of the stomach, with a foul tongue, and a disagreeable sour taste in the mouth, and the dejections are dark coloured and offensive, or else pale and deficient in healthy bile. In some cases, the action of a brisk emetic so completely modifies the character of the secretions, and exercises so much influence for good, as to render active treatment unnecessary; but when it fails to do so, it is especially needful to get rid of the disordered accumulations in the bowels, and to stimulate the whole secreting apparatus of the intestines by alteratives and laxatives judiciously administered. For this purpose nothing answers better than small doses of blue pill, or of calomel in combination with opium and acetous extract of colchicum, followed by a senna or rhubarb draught, containing carbonate of magnesia to neutralize any free acid existing in the stomach; and if small bleedings be employed,¹ and antimony given, whilst a full action is thus maintained, the intensity of the febrile action is speedily mitigated, and the patient is brought into a state to benefit by other remedies. Cases which prove intractable by alkalis, colchicum, and mercury, yield readily to their influence after the febrile action has been subdued by the means just alluded to.²

¹ Not more than from ziv to ʒvj of blood should be taken in these cases.

² Dr. Graves, in alluding to this class of cases, remarks, "Cases of rheumatic arthritis, attended with prolonged excitement of the

In some instances, lemon-juice proves a valuable ally in the treatment of this form of disease, more especially when the patient is cachectic or scorbutic, and has lived almost exclusively on animal or farinaceous food, in foolish dread of wholesome vegetables. Whether it be by its direct influence on the digestion, or by supplying some needful material to the blood, lemon-juice, in many cases, undoubtedly assists in accelerating a cure. In hospital practice, as well as in private life, I have had repeated opportunities of noting this fact, and in several instances the improvement which has followed has been most marked and rapid. Therefore, whenever the sponginess of the gums or the history of the patient leads me to suspect the existence of one of the conditions referred to, I order lemonade made with the juice of one or two lemons to be taken daily as a beverage, in addition to other remedies. It is of little or no service when the urine is clear, pale, and abundant, but when it is scanty, high-coloured, and loaded, it so often proves useful in promoting diuresis and effecting a salutary change in the system, that, whatever the prior history of the patient, I generally recommend its being taken in the manner pointed out. If its flavour rises in the mouth long after it has been taken, it manifestly disagrees, and its use must be discontinued; but if not, its administration should be steadily persisted in.

In most instances the early and assiduous employment of appropriate fomentations will prevent the occurrence of articular mischief, and obviate the necessity for more active local remedies. If, directly inflammation of a joint is set

circulation and copious sweating, are generally found to exhibit an intractable chronicity, and too often terminate in rendering the unfortunate patient a cripple for life." ('Clinical Medicine,' ed. 2, vol. i, p. 488.)

up, that joint be kept at rest and constantly bathed in a warm solution of potash and opium, I am satisfied, from repeated observation, that no other *topical* application will be needed. But the neglect of this simple and rational precaution exposes the structures to the mischievous effect of excessive and protracted irritation, and renders probable the occurrence of actions requiring other measures for their subjugation.

No doubt can exist as to the vast importance of protecting the joints from permanent mischief, and therefore, when the disease, from whatever cause, does show a disposition to fix itself in a particular locality, immediate steps should be taken for its relief. Local depletion, if had recourse to early, is followed by speedy abatement of pain and swelling, and even in subacute and lingering cases, or at a later period of the attack, will still afford considerable benefit. But it is usually necessary to employ counter-irritation in order to effect a complete removal of the mischief. When much effusion or thickening has taken place, something more than mere local depletion is needed to restore the parts to a healthy condition. After cupping and leeches have fairly done their work in unloading the congested vessels and arresting the further progress of effusion, blisters maintain the good effects produced, and remove the evil consequent on the action which has already taken place. A cure which is impracticable by leeches alone, becomes practicable and easy by the joint application of leeches and blisters.

When once it becomes necessary, from the nature of the local mischief, to have recourse to such remedies, they can hardly be employed too vigorously or too constantly. Half a dozen leeches should be applied for several successive days, and should be followed by blisters, repeated until all

symptoms of mischief shall have subsided. In the mean time the affected parts should be kept perfectly quiet. If the wrist be implicated, a splint should be applied, and fastened on by bandages passed over the fingers and round the arm, above the seat of inflammation. Whilst perfect freedom from motion is thus ensured, the wrist itself, uncovered, is open for examination, and ready for the application of remedies. In like manner should the knees, the ankles, or the elbows, be involved, it is often of service to adopt some such measures as those just alluded to, in order to ensure repose.

There is one class of remedies which, in acute rheumatic gout, as in many cases of genuine rheumatism, are frequently of essential service; I mean vapour and hot-air baths, and warm baths of various descriptions. They promote perspiration to an extraordinary degree, and unload the system without greatly depressing it. Hence in those instances which are marked by harshness and dryness of the skin, they prove of inestimable value. One species of bath, which from the nature of the case it is difficult to make use of during a paroxysm of acute rheumatism, may be employed in this complaint with great advantage, namely, the warm bath rendered alkaline by the addition of a pound of the carbonate of soda or carbonate of potash. The value of this auxiliary in combating the disease, has been ably pointed out by Dr. Wright, of Birmingham;¹ and within my own experience many cases which have long resisted ordinary treatment, have yielded readily as soon as this alkaline bathing has been commenced. It certainly possesses virtues which do not attach to the simple warm bath, and I believe its peculiar efficacy is attributable in part to

¹ Lectures published in the 'Medical Times' for June, 1847.

the local action of the salt in stimulating the action of the skin, and in part to absorption of the alkali into the blood. Repeated on alternate days, or daily when the skin is sluggish in its action, a bath of this description appears not only to mitigate the severity of the local symptoms, but to promote a free secretion from the skin, the liver, and the kidneys, and so to be conducive to the restoration of health.

The foregoing observations have been confined to the treatment of the disease as it is met with in the more vigorous, and in those who heretofore have been free from its invasion. In such persons there is evidence of active febrile disturbance; the skin is often hot, the tongue furred, the urine loaded; and as the excretory organs are in a condition to answer to the stimulus of medicine, nothing answers better to check the further formation of the poison, to promote the elimination of that which has been already generated, and to restore a healthy state of assimilation, than the treatment above described. But we are more frequently called upon to administer relief to those whose enlarged and distorted joints give abundant evidence of long-standing mischief, or whose sallow complexion attests the long continuance of general derangement. To such persons the remedies already specified afford but little and only temporary abatement of suffering. In them the whole conditions of the case are altered. The skin is usually cool, and is moist and clammy, or, if not, is harsh and unperspiring; the tongue is but slightly coated; the pulse weak and irritable; and the urine abundant, pale coloured, and of low specific gravity, sometimes containing a trace of albumen; all of which symptoms point most significantly to the presence of a small quantity only of the poison, and to a defective condition of the excretory organs as the principal

cause of its accumulation in the system. Hence medicines which prove serviceable to the one class of patients, are found useless to the other whose excretory organs are faulty or inactive. They often produce alarming depression without fulfilling the object of their administration. In these cases, therefore, another class of remedies has to be called to our aid. As, by giving diuretics and other medicines which act as direct stimuli to the kidneys and liver, we are unable permanently to affect the character of the secretions, we must endeavour to improve the tone of the system generally, and so to render the excretory organs more efficient in their action. Meanwhile we must relieve, as best we may, the more urgent symptoms of the disease, by acting upon the skin and making it perform the extra duty which devolves upon it in consequence of the inactivity of the other organs.

The means by which these ends may be accomplished, assume different aspects under different circumstances. In general, a combination of bark, sarsaparilla, iodide of potassium, and liquor potassæ, when aided by change of scene and air, active exercise, judicious bathing, and constant friction, proves one of the most efficient means of rousing the dormant energies of the system, and restoring the power of the excretory organs.¹ In many instances the happiest results are obtained from this plan of treatment when steadily and properly persevered in. I have seen case after case, in which, under this treatment continued for some months, the patient's general aspect has improved,

¹ The formulæ, I usually employ, are :

Tincturæ Cinchonæ co., ℥jss ; or else Liquoris Potassæ, ℥xlv.

Liquoris Potassæ, ℥xlv ;

Potassii Iodidi, gr. v-x ;

Potassii Iodidi, gr. v-x ;

Extracti Sarzæ, ℥j ;

Decocti Sarzæ co., ℥iij, ter die.

Decocti Cinchonæ, ℥xj, ter die.

his complexion has become clearer, his appetite more regular, the pulse stronger; and in which, coincidently with this improvement in the health, there has been a corresponding alteration in the character of the excretions, and in the severity of the rheumatic symptoms. The urine has regained its normal specific gravity, the alvine evacuations have reassumed their healthy bilious appearance, and all active articular symptoms have subsided, leaving only some thickening about the tendons and ligaments.

Sometimes, however, when the appetite is indifferent, the tongue clean, the urine pale, and the skin clammy, alkalies, even when combined with tonics, do not appear to mitigate the disorder. Indeed, they seem to lower the general tone of the system, and thus indirectly to aggravate existing mischief. The appetite, already indifferent, fails altogether; a sense of exhaustion and nervous depression ensues, and the pains and swellings increase. Under these circumstances, the mineral acids in full doses, combined with bark, quina, strychnia, or other vegetable bitters, and aided by the daily use of the cold shower bath, prove in many cases valuable and trustworthy remedies.¹ Indeed, I know of no combination of remedial agents in the persevering use of which I place so much confidence. Many patients, whose symptoms have long resisted the influence of guaiacum, iodide of potassium,

¹ The following are formulæ I often employ, viz.:

Acidi Nitrici;	Or, Sulphatis Strychniæ, gr. $\frac{1}{6}$;
Acidi Hydrochlorici, āā ℥iij-ʒ;	Acidi Nitrici;
Quinæ Disulphatis, gr. ij;	Acidi Hydrochlorici, āā ℥iij-ʒ;
Tincturæ Arnicæ Montanæ, ℥xxv;	Tinct. Arnicæ Montanæ, ℥xxv;
Syrupi Aurantii, ʒiiss;	Syrupi Aurantii, ʒiiss;
Decocti Cinchonæ, ʒj;	Infusi Aurantii, Co., ʒj;
M. ft. Haustus ter die sumendus.	M. ft. Haustus ter die sumendus.

colchicum, and every variety of alkaline and alterative treatment, and who have been brought to me crippled by long-standing pain and enlargement of their joints, have regained their health, and got rid of their disease, under this treatment. The principal conditions essential to its success are, that the remedies shall be tolerated or assimilated by the stomach ; and that during the period of their administration the secretions shall be carefully watched, and a gentle purgative and alterative pill given, if turbidity of the urine, or a pale or abnormally dark colour of the alvine evacuations, appears to indicate biliary or renal derangement. If the biliary secretions are healthy, and the stomach does not rebel, cod-liver oil is a useful adjunct to the mixture.

In some instances, however, the stomach is so much deranged, that it will not tolerate bark or other tonics ; and, under such circumstances, an emetic forms an admirable precursor of other remedies, and does much towards preparing the way for their administration. On several occasions I have known the appetite return, the digestive function improve, and the excretory organs reassume their due activity, under the influence of medicines which, prior to the action of an emetic, had proved quite inoperative.

In most of the cases in which tonics disagree the liver is very sluggish in its action, and the secretions of the bowels are unhealthy ; consequently, during the administration of these remedies, it is necessary to employ some gentle laxative. Calomel, and indeed every form of mercury, is apt to prove exceedingly depressing, so instead of having recourse to its administration, it often becomes advisable to prescribe a pill containing four or five grains of oxgall, or else a morning draught, consisting of some light bitter infusion, together with aloes and extract of taraxacum. Sometimes taraxacum is of such service, that I rely upon it

even to a greater degree, and prescribe an infusion made with an ounce and a half of the finely sliced root, to eight ounces of boiling water, to be taken before breakfast every morning; or else administer from half a drachm to a drachm of the extract three times a day, in combination with alkalies and the infusion of gentian, adding, when necessary, a little tincture of rhubarb, or half an ounce of the compound decoction of aloes.

In cases which are not accompanied by much hepatic derangement, and in which there is a want of tone in the system, with depression of spirits, coldness of the extremities, and frequent clammy weakening perspiration, the greatest benefit is often derived from the cautious use of the shower-bath. Indeed, among the younger sufferers from this complaint, I know of no single remedy so generally efficacious. Even when, under ordinary circumstances, the patients lack sufficient vigour to withstand its shock, it may be often made available for their relief by their taking it whilst standing in a warm-bath of the temperature of 98° , in which they have been previously immersed, with the view of stimulating the cutaneous circulation. But those persons who have long been victims to this disease, whose conjunctivæ are yellow, and who present other symptoms of biliary derangement, derive greater benefit from the use of the vapour or the hot-air bath cautiously employed, than from any other external remedy. To them the shower-bath is too depressing; it chills and exhausts them, and is not followed by the salutary glow of reaction which ensues after its employment in the younger or less weakly. The warm-bath, too, if frequently employed, proves equally depressing, and often fails in giving rise to that flow of perspiration which is found so efficacious as a relief to the sluggishly-acting liver and kidneys; and,

although a sulphuretted and alkaline bath,¹ or a simple alkaline bath, if cautiously employed and steadily persisted in, is often efficacious, it yet proves slow in producing its salutary effects. But the vapour or the hot-air bath, if not made use of too frequently, and persisted in for too long a period, unloads without greatly depressing the system. It rapidly produces copious perspiration, and the skin thus stimulated to vicarious action, throws off a vast quantity of excrementitious matter which for some time has been accumulating in the blood. Considerable relief is thus obtained during the interval which must elapse before the medicine can fulfil its work of invigorating the system, and restoring the functions of the various excretory organs.

In effecting this salutary change in the constitution, the iodide of potassium is particularly serviceable, and, therefore, unless it prove depressing, I seldom fail to recommend its administration in three or four grain doses. But sometimes, if the appetite is pretty good, the circulation at the same time languid, and the skin inactive, the patient experiences greater relief from its exhibition in combination with the *mistura guaiaci*, than with the mixture before alluded to. If, in such a case there be much languor and debility, and bark be indicated, it is more desirable to add a drachm of the volatile tincture of guaiacum to the bark mixture, than to substitute guaiacum entirely for the cin-

¹ The subjoined formula, by Messrs. Planche and Boullay, makes an excellent artificial Sulphuretted Bath :

Sulphide of Sodium or Potassium, ʒiij ;

Carbonate of Soda, ʒij ;

Chloride of Sodium, ʒij ;

Sulphate of Soda, ʒj ;

Distilled Water, Oj. Mix, and then add to the mixture 20 gallons of Water, at the temperature of 98° Fahrenheit.

chona. If, again, there be much irritability of the stomach, and the bark induce nausea or febrile disturbance, quina is an admirable and effective substitute, and may be administered either with or without sulphate of magnesia, according to the exigences of the case. The addition of fifteen or twenty minims of the dilute sulphuric acid of the 'Pharmacopœia' is often of the greatest service. By such variations in the combination of these remedies, relief may be obtained in most instances, even when it has been sought in vain from the exhibition of colchicum, calomel, and the whole class of medicines which prove beneficial in acute cases, occurring in persons of a more healthy constitution.

Occasionally, however, when the patients are pale and exsanguine, some ferruginous preparation proves a more efficient stimulus and tonic than bark and sarsaparilla. The *Mistura Ferra Composita* of the 'Pharmacopœia,' the Sesquioxide of Iron, the *Ferri Potassio-Tartras*, the *Ferri Ammonio-Citras*, and the old-fashioned steel wine are all excellent preparations, and may be administered in combination with other medicines, according to the circumstances of the case. In some instances, exceeding benefit is derived from the combination of iron with cod-liver oil. A drachm of the syrup of iodide of iron, or fifteen drops of the muriated tincture, combined with three drachms of the oil, has often proved, in my hands, a most valuable remedy; and in no single instance in which its administration has appeared advisable, has the slightest ill-effect resulted from its exhibition. But throughout the period of its administration, it is necessary to maintain a free action of the skin, and to pay particular attention to the bowels. For if the skin's action be sluggish, or the alvine evacuations deficient in quantity, the patient becomes heated, and the articular symptoms are aggravated in consequence. A very slight

purgative is usually sufficient to maintain regularity of the bowels, and nothing answers better than an occasional pill composed of soap, ipecacuanha, rhubarb, and aloes, with now and then the addition of a small dose of colchicum.¹

There are other remedies, however, which may be resorted to with a fair prospect of success, even when all ordinary medicines have failed; amongst which I may mention an infusion of the leaves of the *Fraxinus excelsior*. Few remedies have been more highly praised by those who have had recourse to its assistance, and few certainly are less known, or less generally employed. Indeed, in England its anti-rheumatic properties are so little known, that I have searched our medical literature in vain for the record of a single case in which its remedial powers have been tested. This is the more remarkable because it has been a favorite remedy with the peasants of Auvergne, and other parts of France, for above half a century, and for some years past has attracted the attention of the Profession on the Continent. So long ago as the year 1852, Messrs. Pouget and Peyraud published a very interesting account of its curative virtues.² These gentlemen assert, as the result of their experience, that "the infusion of the leaves is perhaps a true specific, combining with the most powerful curative action, the advantage of not giving rise to any of the dangers

¹ The following are pills I frequently employ, and have found exceedingly useful:

Ipecacuanhæ, gr. jss.	Or, Ipecacuanhæ, gr. jss;
Saponis Castiliensis, gr. iv;	Pilulæ Hydrarg., gr. j;
Pil. Rhei Co., gr. iij;	Pilulæ Rhei Co., gr. iij;
Ext. Aloes Aquosi, gr. j, M. ft.	Ext. Colchici Acet., gr. ij, M. ft.
Pilulæ ij, quarum sumantur j,	Pilulæ duæ, quarum suman-
vel ij, horâ somni.	tur j, vel ij, horâ somni.

² See the 'Union Médicale,' Nov. 27, 1852.

or inconveniencies which result from the use of colchicum.” “It causes neither nausea, sickness, general discomfort, nor depression,” but “generally at the end of four or five days, and sometimes sooner, the pain, redness, and swelling have sensibly diminished in intensity, or have even disappeared.” In muscular rheumatism and in other forms of the disease it is also spoken of as an excellent remedy.

My own experience does not warrant my speaking in such unqualified terms of its curative powers, but it does justify my stating that some cases are greatly benefited by its agency. I have already met with several instances in which the disease, after resisting ordinary remedies, has yielded to an infusion made with one ounce and a half or two ounces of the leaves to half a pint of water, combined with such other medicines as the peculiar circumstances of each case demanded. Moreover, the patients who are most benefited by its administration are the very persons on whom colchicum is almost useless on account of its depressing or purgative action. Thus its remedial action has been displayed most strikingly in persons already exhausted by the disease—in persons with a disordered condition of the stomach, liver, and bowels, subject to profuse, clammy perspiration on the slightest exertion; whose urine is at one time scanty and turbid, at another abundant, pale, and of low specific gravity. In such persons, it appears to stimulate the whole secreting apparatus, and to give tone to the digestive organs; it invigorates the system and checks the enfeebling sweats; and certainly, in some instances, is productive of effects which are sought in vain from quinine and other bitters.

At present, my own experience of its administration is not sufficiently extended to enable me to speak with confidence as to its *modus operandi*. In some few instances I

have given it uncombined with other remedies, and have been unable to perceive any effect from its exhibition beyond that of gradual improvement of the health, and abatement of the pain and swelling. Occasionally, it has given rise to some slight temporary relaxation of the bowels, but more generally it has proved without purgative action, and has not appeared to exercise any decided influence over the secretion of the kidneys. Indeed, its curative effects have been displayed at times when I was able to perceive so little real alteration in the condition of the excretions, that I have been led to regard its efficacy as dependent on a specific alterative influence exerted over the process of assimilation. Just as colchicum exerts what may be termed a specific curative action, quite independently of its action as a sedative or eliminative, so also, I believe, does the *Fraxinus excelsior*, quite independently of its action as a tonic. But let the explanation of its mysterious agency be what it may, the fact remains that, administered with due regard to the condition of the patient, the infusion of the leaves proves a valuable remedy in certain cases of rheumatic gout, and in those especially which are characterised by want of tone in the system, and by an inordinate and unhealthy action of the skin.

In strong contrast with the action of the remedy whose virtues we have just discussed, stands that of another medicine which proves a faithful ally in many obstinate cases of rheumatic gout. I allude to arsenic. It must have been within the experience of every medical man to meet with instances of rheumatic gout marked by extreme inactivity of the skin. The patients referred to suffer greatly from cold, and rarely, if ever, perspire, however warmly they may be clad, however active the exercise they take, and however great the heat to which they may be subjected. Such cases

are always more than usually obstinate, and are thoroughly intractable to ordinary remedies.

Now in these instances arsenic will often furnish the requisite stimulus to the system. Whatever its precise mode of action, whether by rousing the activity of the capillary system, by exciting cutaneous exhalation, or by imparting fresh tone and vigour to the nervous system, and thus indirectly improving assimilation, most certain it is that in a large proportion of the cases referred to, improvement is manifested from the very date of its administration. The languor and depression which characterise the disease pass off; the complexion improves; the skin loses its dryness and harshness; the excretions re-assume their healthy character; the patient gains flesh, and the rheumatic or gouty symptoms subside. Therefore, not unfrequently when other remedies have failed, I have had recourse to its assistance, and although in some instances it has not fully realised my expectations, I have never had reason to regret its administration. Given in moderate doses *immediately after meals*, it rarely produces the slightest discomfort, and even when it does give rise to temporary nausea, all unpleasantness may be got rid of by suspending its administration, and then diminishing the dose. If the urine be turbid, I usually prescribe from eight to fifteen minims of the liquor potassæ arsenitis in combination with the acetate and bicarbonate of potash, whereas if the urine be clear and of low specific gravity, or if the mineral acids be indicated, I order from ten to twenty drops of the liquor arsenici chloridi, either alone or in combination with bark and hydrochloric acid. By thus varying the form in which it is given, according to the different circumstances of the case, by watching the patient carefully during the period of its administration, and by jealously guarding against constipation, not only

may this medicine be employed with a fair prospect of affording relief which would be otherwise unattainable, but the patient may be securely guarded against the disagreeable effects which are caused by its action when it is given incautiously or improperly.

Unlike many other remedies which prove useful in certain cases of rheumatic gout, arsenic speedily influences the system, and I have rarely met with an instance in which improvement has resulted from its administration if some symptom of amendment has not been manifested within a fortnight or three weeks from the date of its first exhibition. Indeed, the only exceptions to this rule have been cases in which, from the peculiar circumstances attending them, it was deemed inexpedient to begin by giving more than a very small dose of the remedy—a dose insufficient to produce a speedy result. This of itself is a great encouragement to the physician to test its remedial power in obstinate cases which seem likely to be benefited by its action, and from the marvellous effects which I have witnessed as a result of its exhibition, I feel justified in stating that no case of rheumatic gout can be regarded as incurable, on which its influence has not been fairly tried.¹

Another remedy which I am unwilling to pass by without a brief notice, is the *Arnica Montana*, or Leopard's

¹ Whilst these pages were passing through the press, my attention has been directed to a remarkable case in point, recorded by Mr. Watson, of Cottingham, in Yorkshire. The patient, a man sixty years of age, had been a martyr to the complaint nearly twenty years. Crippled, helpless, and exhausted, he seemed likely at no distant period to fall a victim to the disease. Within a month after the first dose of the arsenical solution, he slept comfortably, ate heartily, and was able to walk to church, a quarter of a mile distant. (See '*Association Med. Journ.*,' Jan. 19, 1856.)

Bane. In Germany and in other parts of the Continent it is extensively used internally, as a stimulant and diaphoretic; and in our own country, as I am informed, it occupies a conspicuous place in some of the quack remedies for gout and rheumatism. But I have been unable to find any record of its use internally by professional men in England, and, as far as I am aware, it has not been so employed except by myself. I am the more anxious therefore to give the result of my experience as to its action.

The class of cases in which it has afforded me the greatest assistance is that which comprises patients who are feeble and exhausted, whose skin is cool, whose pulse is weak and slow, and whose urine is of low specific gravity. Its operation appears to be that of a nervine stimulant and diaphoretic. It increases the nervous force, rouses the circulation, and so promotes more perfect assimilation and a more healthy action of the different excretory organs. To these properties, I believe, it owes its value as an adjunct to other remedies in the class of cases just referred to. For the same reason it fails to exercise a beneficial influence in cases characterised by nervous excitability, with a quick pulse, heat of skin, and turbid urine. In such cases it is apt to produce headache, nausea, or even vomiting, wakefulness at night, and other symptoms of disturbance of the nervous system. But let its *modus operandi* be what it may, I have so often observed marked benefit from its administration, that I cannot doubt as to the expediency of employing it in appropriate cases. Given in the form of tincture or infusion,¹ in combination with cod-liver oil, vegetable

¹ Of the tincture in common use, ℥xx to ℥xxx may be given as a dose, or from ʒiv to ʒi of an infusion prepared by macerating ʒvj of the flowers or of the root in Oj of boiling water.

bitters, and alkalies or the mineral acids, according to the nature of the case, it often proves extremely serviceable, and produces effects which are sought in vain from the same class of remedies, unaided by its stimulating action.

There is yet another class of cases, however, in which none of the remedies hitherto mentioned are of much avail. I allude to those which have arisen in sequel of syphilis or gonorrhœa. Such cases oftentimes do not occur until five or six months after all primary venereal symptoms have disappeared; and so unwilling are the patients to believe that their former ailment has any connection with their present attack, that it is sometimes difficult to elicit an admission as to the possibility of the existence of a venereal taint. Yet so obstinate do some such cases prove until appropriate remedies are administered, and so readily do they yield when the treatment is directed against this presumed cause, that there cannot be a doubt as to their venereal origin. In all public institutions, cases of this sort are of frequent occurrence; and I have had reason to believe that even in private practice they are more numerous than is commonly supposed. Sometimes, indeed, where mercury has been taken freely for the cure of the original malady, and has been pushed to salivation, the rheumatic cachexia is connected, I believe, with the effect of mercury on the system rather than with any remains of the venereal poison; and in such instances I have usually found that bark and sarsaparilla, combined with full doses (gr. v to x) of iodide of potassium, and aided in their action by an occasional vapour bath, have sufficed to eradicate the disease; but where, as not unfrequently happens, the primary syphilitic sores have been followed by ulceration of the throat, cutaneous eruptions, or other secondary symptoms, I have found nothing so useful in restoring health and ridding the patient of

his rheumatic gout as the biniodide of mercury in combination with bark, the compound decoction of sarsaparilla, and a generous diet. The same may be said of the disease as it occurs in sequel of gonorrhœa. The iodide of potassium, though often useful when administered in full doses, seems in these cases insufficient of itself to arrest the mischief, but when given in conjunction with a drachm and a half or two drachms of the liquor hydrargyri bichloridi it speedily produces a beneficial result. Case after case has come under my care at St. George's Hospital in which the combined influence of iodine and mercury has arrested the disease, after it had long withstood the action of these remedies exhibited separately.

As soon as the disease has yielded, and general debility only remains, nothing proves more useful than a combination of iodide of potassium with the syrup of iodide of quinine and iron; and this or some other form of tonic should be taken for some weeks after all pain has subsided, with the view of guarding against the recurrence of the disease.

Thus then, whilst attending to the condition of the internal organs, the practitioner should administer one or more of the remedies already mentioned, according to the varying circumstances of the case. But he should not neglect to provide in other ways for the relief of the local symptoms and the elimination of the poison which has been already generated. He should call to his aid such external applications as have the power of lulling pain and maintaining warmth in the affected parts, of exciting free cutaneous action, and of promoting the absorption of any matters which may have been effused. The first-named indication may be readily fulfilled by employing the opiate and alkaline fomentation, mentioned in the Chapter on the

treatment of acute rheumatism.¹ If the joints be wrapt up in flannel saturated by the aforesaid solution, a genial glow and perspiration are induced, and the pain is speedily relieved. Even if there be no local redness or swelling, it is desirable to clothe thickly with cotton wool all parts in which pain or uneasiness is felt. By this simple expedient much unnecessary suffering is prevented, and the patient, thus enabled to sleep without having recourse to opiates, escapes the wear and tear which inevitably result from long-continued pain, and is placed in a position to profit by any measures calculated to invigorate the constitution and restore a healthy state of assimilation.

Sometimes, even when these expedients fail, relief is afforded by the topical application of a leaf of tobacco. Care should be taken in selecting a fine leaf of true Virginian tobacco : its main ribs or fibres should be taken out in order that the leaf itself may fit close to the skin, and then, after being steeped in or moistened with hot water, it should be placed round the joint, and covered with oiled silk or thin gutta percha. On several occasions I have known this application afford speedy relief.

Amongst other expedients for promoting the restoration of health, may be mentioned, the constant use of friction, and full daily ablutions. Those who are subject to rheumatism are well aware of this important fact, and rarely fail to maintain, by means of the flesh brush, that unobstructed condition of the skin's pores which is essential to free cutaneous transpiration, and so to the elimination of the morbid matter. Nothing, indeed, proves more con-

¹ See p. 117.

ductive to the cure of rheumatism or rheumatic gout, which has passed into a chronic and inactive form.

But there are some local consequences of the disease, for the relief of which the measures just alluded to prove utterly inefficient. After all local symptoms of inflammation have subsided, and the swellings have in most parts disappeared, there oftentimes remains some thickening about the joints, or an effusion into the capsules, the bursæ, or the sheaths of tendons, which resists all ordinary attempts to produce its absorption. Sometimes the knee-joint is the refractory part, and if so, repeated blistering, followed by the application of mercurial ointment to the blistered surface,¹ proves an effectual method of stimulating the absorbents and getting rid of the obnoxious secretion. But sometimes these measures fail in their effect, and it frequently happens that some of the small joints of the fingers to which blisters cannot be readily applied, or the sheaths of tendons, or the bursæ in the immediate vicinity of the joints, are the parts which call for remedial intervention, and then it is usually expedient, if not necessary, to have recourse to some other mode of relief. In such cases liniments and embrocations have been recommended, and, in some instances, considerable benefit has been derived from those of a terebinthinate and oleaginous nature. But, generally, such applications possess little virtue beyond that which attaches to them in consequence of the friction which accompanies their use;

¹ "The doctrine of a preliminary constitutional affection being absolutely necessary in order to obtain the specific action of mercury on any particular organ, is wholly untenable; while, on the other hand, there is a host of evidence to prove that locally applied it produces a primary and distinct effect, totally independent of its action on the general economy." (Dr. Graves's 'Clinical Medicine,' ed. 2, vol. i, p. 490.)

and far greater benefit will be usually obtained from the local application of iodine to the affected joints, than from the whole of this class of remedies. The usual practice has been to paint the affected parts with the compound tincture of iodine, or even with a stronger application, consisting of a drachm of iodine, and a drachm and a half of iodide of potassium, dissolved in an ounce of rectified spirit daily or twice a day if the skin will bear it, until the effused fluid is entirely absorbed. But these lotions generally produce smarting and desquamation of the cuticle, and not unfrequently vesication after the second or third application; so that, although they may prove useful as counter-irritants, they cannot be of any service as absorbents. Some persons, therefore, have preferred the iodide of potassium ointment, or cod-liver oil containing iodine in solution, both of which are far less irritating in their nature. But the most useful form in which iodine can be applied, and one which I would strongly recommend to the Profession, is in very weak solution, combined with glycerine, to prevent its drying.¹ The advantages which this possesses over all other applications are, that it does not irritate the skin, if due precaution be observed in its employment; that it may be applied without intermission for weeks, or even months, if necessary; that it is readily absorbed, and produces the specific topical action of iodine, without uneasiness or inconvenience to the patient; and that, as the glycerine prevents its drying,

¹ Subjoined is the form of lotion I usually employ—

Tincturæ Iodini Compositæ, ʒiij—ʒvj.

Glycerini, ʒiiss;

Aquæ Destillatæ, ʒiv.

M. ft. Lotio.

To this I often add Hydrargyri Bichloridi, gr. iv—vj, forming a soluble Biniodide of Mercury.

the lint or rag on which it is applied need be wetted only once in the twenty-four hours. By the aid of this lotion, with the addition occasionally of a few grains of bichloride of mercury, forming a soluble biniodide, I have been often enabled to reduce swellings of the joints, which for months had resisted every other plan of treatment; and on several occasions have had the satisfaction of restoring the use of limbs which had been pronounced hopelessly crippled by competent medical authorities.¹

Another very useful application, more especially when the smaller joints are principally implicated, is an ointment containing a drachm of calomel, or from four to six grains of the bichloride of mercury, and two drachms of iodide of potassium, to an ounce of lard. In several cases I have seen the thickening and enlargement yield to these remedies steadily persevered in, after having long withstood the action of iodine uncombined with mercury. In some instances, however, greater benefit is derived from the application of the emplastr. ammoniaci c. hydrargyro, or soap plaister with iodine, than from the ointments just referred to.

When the larger joints have been affected, and thickening and stiffness remain after the more fluid parts of the effusion have been absorbed, a different mode of treatment is oftentimes necessary. The parts no longer require the powerfully absorbent influence of iodine or mercury, but they need the stimulating action of friction combined with the relaxing and deobstruent effect of local warmth and perspiration. In some instances, the cold douche, followed

¹ For a remarkable case in point, see case of George Wood, in 'Hospital Case Book' No. 2, for Nov., 1857, p. 145. This man contracted the disease in India, and had been discharged from the army as incurable.

by friction, and subsequently by the wet bandage, proves the most effectual method of restoring motion to the joint ; in others, douches of steam or hot water, followed by the wet bandage or warm fomentations, frequent inunction with some bland oil, or better still, with cod-liver oil holding iodine in solution, repeated daily rubbing, the warmth, support, and gently stimulating influence of various plasters, and the use of galvanism, are the means best calculated to effect the desired object.

But sometimes, in addition to enlargement and stiffness, there exists some actual contraction of the limbs. It then becomes necessary to adopt some means not only to relieve the joint, but to loosen the ligaments and set free the tendons on which the contraction of the limb depends. For this purpose forcible yet gently applied extension of the limb must be employed. If at an early stage of the complaint this precaution is observed, all permanent contraction may be surely prevented, and even at a later stage, when the contracted tendons seem almost to require the surgeon's knife for their relief, a judicious combination of local bathing, with manual friction and frequently repeated extension of the limb, will often render operative interference needless. By means such as these, I have been enabled on several occasions to get rid of contractions of some years' standing ; and it is by these or very similar measures, that certain irregular practitioners in this country and on the Continent have acquired a reputation for the cure of enlarged and contracted rheumatic joints. In all cases time is an essential element in the production of a favorable issue ; no change will be manifest for many weeks, —it may be for two or three months after a course of treatment is commenced ; and even when the stiffness begins to yield, the progress towards cure will not be rapid.

Therefore, before undertaking the management of such a form of disease, it is always advisable to explain the circumstances fully to the patient, in order that the treatment may not be commenced unless he resolves to give it a fair trial. So fully has experience convinced me of the inutility of half measures on these occasions, that I now make a point of refusing to take charge of patients so afflicted, if they declare themselves unwilling, or, from circumstances, unable, to submit to at least a three months' course of treatment. Even this period will seldom suffice for a cure, and any plan of treatment, however judicious, if persisted in only for a shorter time, will assuredly fail in its object, and not only cause disappointment to the patient, but bring the physician into unmerited disrepute.

One of the simplest and most efficient methods of exerting gradual extension of the limb, is by the use of a smooth inclined plane as a leg-rest. The apparatus can be made by any carpenter or upholsterer. It consists of a piece of smooth or polished mahogany, or other wood, about a yard in length, and nine or ten inches in diameter, supported at its lower extremity by a piece of wood, or leg, of sufficient height to raise it about four inches from the ground, and at its upper end by a similar piece of wood of sufficient height to elevate its edge to a level with the chair on which the patient is seated. When the contracted limb is placed on this inclined plane, the weight of the leg forces the heel downwards, and thus produces gradual extension. The force thus exerted is such that it cannot be borne without discomfort for longer than twenty minutes or half an hour; but if the leg-rest is resorted to for that period three or four times in the course of the day, and manual friction be employed at the same time, or immediately afterwards, a marked change will be observed in the limb

within the space of a month or six weeks. If the stiffness and contraction be of long standing, the steam douche should be used to relax the parts before the leg is placed on the rest, and the joint, after being thoroughly rubbed, should be covered with an iodine plaister or the emplastikum ammoniaci cum hydrargyro spread on wash leather, as in this way as much progress is made in the course of a week as would result in a fortnight without this assistance. In one instance I was enabled by these means, persevered in for a period of nine months, and aided in their effects by the occasional use of stimulating and absorbent embrocations, to straighten a leg which had been contracted during the space of four years and a half. Of course, if bony ankylosis, or distortion of the knee, has taken place, success cannot attend our efforts, however judiciously directed, and perseveringly employed; but when, as is usually the case, the contraction depends upon simple glueing together of the structures, external to the joint, with thickening of the capsule, and possibly some remains of effusion within its cavity, or into the bursæ external to the joint, I see no reason for despair as to straightening the limb, however long contraction may have existed.

One subject, and that by no means an unimportant one, still remains to be noticed. The imperfect condition of the assimilating function requires the observance of the strictest rules of diet. The food should be wholesome and nutritious, but not of an over-stimulating character, and whether fish, or flesh, or fowl, be taken, it should be simply drest, and eaten sparingly and at regular hours. With it may be taken some well-cooked vegetable, though in a very small quantity, as tending to promote acetous fermentation; and for the same reason salads and pickles should be avoided, as also beer, sugar, and all sweets. More specific

injunctions can hardly be laid down axiomatically ; but, as a general rule, I would assert with Lord Bacon, “it is a safer conclusion to say, ‘this agreeth not well with me, therefore I will not continue it ;’—than, ‘I find no offence of this, therefore I may use it.’ ”¹

The above, and other similar cautions respecting diet, are so generally admitted as essential, that it is unnecessary to insist on them more strongly. But there is one point on which the same general feeling does not exist, and as I am thoroughly convinced of its importance, I wish to draw special attention to it. Tea and coffee, and water, are not usually included among the articles on which the physician feels called upon to give specific injunctions, or the patient to exercise ordinary common sense. The sufferer from rheumatism and rheumatic gout, who denies himself every culinary luxury in the hope of getting rid of his troublesome enemy, permits himself at dinner to drink water to satiety, and at breakfast and tea to sip cup after cup of his favorite beverage, until his thirst be appeased or his stomach incapable of further distension. Now, although water, coffee, and tea, are not prejudicial when taken in moderation, yet, in large quantities they oppress the stomach, dilute the gastric juice, and exert a baneful influence on the process of digestion. No person in health can long indulge in inordinate quantities of liquids at meal times with impunity, and to persons whose digestive organs are impaired, they are little less than poisons. They may prove grateful, or indeed useful, as diluents, if taken *in moderate quantity*, when the meal is three parts finished, but at an earlier period they should be taken very sparingly, as if taken freely they are decidedly prejudicial.

¹ Bacon's ‘Wisdom of the Antients.’ “Essay on the Regimen of Health.”

There are many exceptions, however, to these rules respecting diet, which it is necessary to point out clearly, inasmuch as the recovery of the patient may depend upon their full and practical recognition. They occur chiefly amongst those sufferers from rheumatic gout who present a clean tongue, a cold and clammy skin, and a very feeble pulse. In them, a spare diet and abstinence from stimulants would counteract all the good which would accrue from the use of medicine. It behoves such persons to be cautious as to the selection of their food, and equally so to masticate it thoroughly; but, unlike the dyspeptic patients, with coated tongues and turbid urine, to whom the former observations respecting diet apply, they need light, nutritious food at shorter intervals than usual, and seldom get on comfortably without a certain amount of sherry, brandy, gin, or whisky. Their appetite is seldom good, and they require beef tea or other light nutriment between their regular meals, and some amount of alcoholic stimulant to rouse their dormant energies, and enable them to digest their heavier meals. Even ale and porter need not always be prohibited. The test of its being required by the system is, that whilst it is being taken the tongue continues clean, the urine clear, and the skin cool. If any derangement of the secretions should occur, the diet even in these cases must be altered, and the use of the stimulants for a time at least discontinued. Under all circumstances, Cicero's advice must be remembered, that "*tantum cibi et potionis adhibendum, ut reficiantur vires, non opprimantur.*"¹

Above all things, it is needful for the sufferer from rheumatic gout to take exercise freely and regularly—exercise suited to his strength and condition, but always sufficiently

¹ Cicero de Senectute.

active and sustained to produce a free perspiration. Nothing tends more directly to the perfect oxygenation of the blood, and to the furtherance of those actions on which the ultimate cure must mainly depend. And, as the function of the kidneys is almost always impaired, it is most important to maintain a regular action of the skin, and to guard against damp and chills, and the ill-effects of atmospheric vicissitudes, by means of warm clothing. The patient should be clad in flannel or fleecy hosiery, from head to foot, and, should he perspire freely while taking exercise, he should never neglect, on returning home, to change his under-garments, and to make use of friction, by the flesh-brush or coarse towels.

Sometimes, however, after several attacks, the disease, acting upon textures already weakened, appears to be beyond the power of ordinary remedies. In spite of the best-directed efforts of the physician, even when aided by the greatest caution on the part of the patient, the stomach performs its functions feebly and irregularly; the appetite remains indifferent; the food is imperfectly assimilated; the skin, the kidneys, and the liver, continue sluggish in their action; effete matters are consequently retained in the system, the joints become more enlarged and distorted, and the general health gives away. Under these circumstances, recourse must be had to the various thermal springs with which Nature has endowed both this country and the Continent, as if for relief of the disease in question. When everything else fails, they not unfrequently afford extraordinary and permanent relief. Whatever the *modus operandi* of the waters, their free use, both internally and externally, exercises a beneficial influence, which is in vain sought from medicine and bathing in other places. The effect produced is at once sedative and tonic. The pain-

worn sufferer, irritable and anxious, repairs to the springs, unable to sleep, and troubled with dyspepsia, connected with a sluggish condition of the skin, liver, kidneys, and bowels. After ten days' or a fortnight's trial of their virtues, he begins to find himself less irritable, less anxious, and less wakeful; he sleeps more soundly, and feels more refreshed by his sleep; his digestion improves, the whole system is invigorated; and, after a time, the excretory organs act so much more efficiently, that it becomes unnecessary to have recourse to medicines for their relief. Coincidentally with this increased freedom in the various channels by which the excretions are carried out of the system, and with the greater purity of blood which consequently ensues, there is observed a decrease in the articular symptoms, which arise, as I have shown, from a vitiated condition of the circulating fluid. There is no fresh accession of pain or inflammation, no recurrence of synovial effusion, no increase of thickening about the joints. On the contrary, the enlargement gradually subsides; and by assistance of the water, applied in the form of douche, whereby local friction is combined with fomentation, the stiffness disappears, and the patient to a great degree regains his former activity.

It might be supposed, that the importation of the various waters would render a visit to their source unnecessary. But such is not the case. The natural waters may be taken regularly at home, and diligent use may be made of baths containing the same constituents in solution, but the effect is far different from that observed during a residence at the springs. The vast importance of the total change of scene, and air, and habits, consequent on a visit to the English or continental watering-places, can hardly be over-estimated: a new stimulus is imparted to the system; the

organic functions receive an impulse which cannot be communicated to them in any other way; and remedies which have proved unavailing at home, very shortly become active agents for good. Indeed, it is a question whether the benefit derived from a visit to any of the thermal springs is not attributable almost as much to this sort of influence, as to the medicinal action of the waters.

The only question, therefore, which arises in each particular instance, is as to the place best calculated to promote the well-being of the patient. In this country the waters of Bath, Harrogate, Buxton, Woodhall, and Droitwich; abroad those of Aix-la-Chapelle and Barèges; Wiesbaden, Wildbad, and Baden-Baden: Carlsbad, Teplitz, and Vichy,¹ are among the most celebrated and efficient; but, of course, the physician's selection must be determined by the result of his inquiries into the history of each case. The baths of Harrogate, Aix-la-Chapelle, and Barèges belong to the class of sulphurous waters, and being more stimulant than the other waters alluded to, are sometimes of service in old-standing atonic cases, even when other springs have failed. The two latter are peculiarly adapted for persons of a feeble circulation, who are invigorated by warmth, and suffer greatly from the effects of cold; whilst the first-named spring is suited for invalids to whom the dry bracing air which sweeps over the high tableland immediately adjoining Harrogate is likely to prove grateful and beneficial. Judiciously administered, and varied according to the circumstances of each case, the sulphurous waters in this country and on the Continent have proved a source of renewed health to many a victim to rheumatic gout. The springs of Bath, Wiesbaden, Baden-Baden, and Teplitz, contain in solution a small quantity of iron, and hence are especially

¹ The temperature and composition of most of these waters are given in the Table appended to this chapter. See pp. 396-400.

useful whenever there is a deficiency of red globules in the blood. Those of Carlsbad, which also contain iron, prove eminently serviceable in atonic bilious subjects whose livers are inactive, and whose secretions generally are sluggish. The waters of Vichy are strongly alkaline, and are most beneficial in cases characterised by extreme acidity of the stomach and of the excretions, whilst those of Buxton and Wildbad, which are strongly impregnated with nitrogen gas, have earned a well-merited reputation in cases marked by the existence of wandering pains, without the concurrence of inflammatory action,—in cases therefore which require alterative waters rather than those of a more stimulating nature. To persons whose skin requires stimulating, and who cannot bear the relaxing effect of the various hot springs, the saline bath of Droitwich is particularly adapted ; to those whose systems are tainted with the venereal poison, or are injured by the administration of mercury, and to those again who are suffering from chronic enlargement of the bursæ and effusion within the capsular membrane, the iodine and bromine springs of Woodhall, in Lincolnshire, are especially useful ; whilst those of other places, to which I need not here allude, are equally serviceable in a different class of cases, when administered with due regard to the condition of the patient. But observation has convinced me, that the pallid victim to rheumatic gout, who suffers from cold, and is unable to bear the stimulant effect of the sulphur waters, will usually experience more relief from a month's residence at Bath, than from a much longer sojourn at any other watering-place.

There is one class of cases, however, which prove extremely intractable, whatever the means adopted for their relief. They are characterised by the unusual pallor of the patient, the dryness if not harshness of his skin, the paleness and low specific gravity of the urine, and an utter want

of tone in the system. In all cases of rheumatic gout, more especially when occurring in a chronic form, the condition of the urine is of primary importance, as exhibiting at a glance an active or a sluggish state of those organs through whose agency the elimination of the *materies morbi* is in great measure effected, and without a due action of which it is difficult to conceive that a cure can be permanent. In the obstinate cases just alluded to, this defective condition of the urinary secretion is even more prominent, and is sometimes connected with permanent alteration of the structure of the kidneys, which increases with the progress of the disease until complete degeneration of their secreting apparatus takes place.¹ If the urine be allowed to stand for some hours in a funnel-shaped glass, and the sediment which results be then examined under the microscope, scales of glandular epithelium will be seen, containing an undue proportion of oil globules and granular matter, and here and there will sometimes be observed a fibrinous cast of an uriniferous tube, and some small aggregations of amorphous granular matter and half-broken epithelium. Moreover, if the urine be concentrated by evaporation—sometimes, indeed, without previous concentration—a slight coagulum of albumen will be formed under the influence of heat and nitric acid. After death, the cause of this abnormal condition is apparent: the kidneys are found atrophied, granular on their surface when their capsule is peeled off, and utterly diseased in their intimate structure. Hence the cause of their defective action; hence, also, the

¹ This complication is of frequent occurrence in true Gout, and appears to be dependent on, or intimately connected with, the causes which produce the original disease: in Rheumatic Gout, on the contrary, it is of rare occurrence, and seems to be an accidental coincidence, in no way connected with the morbid changes in which the primary disease takes its origin.

lingering chronicity of the disease. The only aid we can rationally expect to give a patient whose kidneys are thus diseased, is that afforded by inducing a free action of the skin, liver, and bowels, and by regulating the amount and nature of the food. By relieving the diseased organs of part of their work; by stimulating the healthy secreting apparatus to take on vicarious action, and so to assist in the elimination of the poison, as also by strict attention to diet and regimen, we may do much towards warding off the final catastrophe. Though we cannot effect a cure of the disease, we may render our patient's sufferings endurable, and enable him to pass the remainder of his life in comparative comfort to himself and family.

Hitherto I have made only slight allusion to the various complications which render this complaint peculiarly formidable, and call for immediate relief. Nor do I intend to enter at any length into the discussion of symptoms which, though sometimes arising in the course of this disease, are yet of frequent occurrence under other circumstances, and do not demand any specific treatment. Inflammation of the brain has been met with, though rarely, and has occurred almost invariably coincidently with the subsidence or sudden retrocession of the articular symptoms.¹ Moreover, in almost every case on record, it has supervened after the disease has been limited for some time to one or two joints, and its attacks have been confined to persons in an unhealthy cachectic condition, who have been exhausted and rendered irritable by the long continuance of the dis-

¹ Since the publication of the first edition of this work, I have seen reason to doubt whether inflammation of the brain, or pleurisy, is ever set up as a consequence of rheumatic gout. I have never met with a case in point, and, after carefully reconsidering the recorded cases, my impression is that they were all instances of true gout or true rheumatism.

ease. Its symptoms have seldom exhibited the same activity as those which ordinarily accompany inflammation of the brain; there has seldom been much inflammatory fever or violent delirium, but the disease has gone on rapidly to a fatal termination, with headache, incoherence, strabismus, paralysis, and symptoms of pressure on the nervous centres. Instances in point may be found recorded in Sir Benjamin Brodie's work 'On Disease of the Joints,'¹ in Dr. Macleod's chapter on 'Capsular Rheumatism,'² and in several of the medical periodicals; but as all the cases are devoid of interest, save only in so far as they serve to illustrate the reality and danger of such an occurrence, I shall content myself by referring to the fact of their having been recorded, and impressing upon all those who may have charge of patients labouring under this disease, the necessity of taking active and immediate measures should headache, vertigo, somnolency, impaired memory, or any other symptoms appear to indicate commencing mischief within the cranium. Should such symptoms be accompanied, as they usually are, by the subsidence or disappearance of articular swelling, it may be worthy of consideration, whether by the application of mustard poultices and blisters, it may not be possible again to attract the morbid agent to the joints, and so to avert the fatal consequences which must follow the concentration of its whole force upon the brain.

Pleurisy is a more common, and practically, therefore, a more important complication.³ In some instances, where the system is low and susceptible of irritation, pleuritic inflammation is readily excited, and often occurs without any manifest decrease in the articular symptoms. Frequently, in such cases, the morbid action is limited in

¹ Ed. 4, p. 51.

² On 'Rheumatism,' p. 118.

³ See Note on p. 382 of this Treatise.

extent, and may be easily checked by appropriate treatment. But in other cases it arises coincidently with, and probably in consequence of the sudden subsidence of, the articular swelling; and then if the system be depressed, it is rapid in its progress, pus-generating in its character, and little under the control of medicine. In such instances the whole virulence of the poison appears to be concentrated upon the inflamed membrane, and the patient sinks, in part from the shock, and in part exhausted by the irritation of the disease, and by the oppression to the breathing which results from an accumulation of pus and serum in the pleural cavity.

Deafness is a complication which unfortunately arises in a large proportion of patients who suffer from rheumatic gout, and proves at once distressing to the sufferer, and extremely obstinate in its continuance. The small bones of the ear become involved in the changes which have been already traced in connection with the articulations of the extremities, and distortion and loss of motion result. Not unfrequently the action of the tensor tympani appears to be interfered with early in the attack, producing partial deafness; and as soon as distortion of the bones has proceeded beyond a certain point, and rigidity of their articulations has occurred, the muscles become utterly incapable of moving them, and complete deafness ensues.

The plan of treatment commonly pursued in these cases is the application of blisters and irritating ointments behind the ears, followed by mercurial inunction, and the internal administration of mercurials and alkalies; but having known this method fairly carried out by experienced aurists in a large number of cases almost uniformly without success, I cannot but doubt whether it exercises the slightest curative influence. My own observation would rather lead me to recommend the administration of

tonics, cod-liver oil, and remedies which experience has proved to be productive of relief to the local effects of the disease in other parts of the body, and at the same time to have recourse locally to the absorbent influence of the biniodide of mercury ointment rubbed in behind the ears.

Inflammation of the eye is another complication of considerable importance. It occurred in 11 out of the 130 cases of rheumatic gout which were admitted into the hospital during the time I held the office of the Medical Registrar, and it has suffered more or less severely in 14 out of 193 cases which have fallen under my own care at the hospital.¹ In private practice, too, within the last few years, several gentlemen have consulted me for the same train of symptoms. Therefore, although inflammation of the eye is comparatively rare in rheumatic gout, it is sufficiently common to demand our serious attention.

Affections of the eye, in connection with rheumatic gout, are usually seen in those who are thoroughly out of health or exhausted by repeated attacks of the disease. The inflammatory process is not confined to any particular part or texture of the eye, but often attacks, either together or in succession, the various coats of which the eye is com-

¹ Since the above paragraphs were published in the first edition of this work, I have seen reason to doubt whether the affection is so common as these figures would appear to indicate, and whether many, if not all, of the cases in which this complication arose may not have been cases of obscure gout or of gonorrheal rheumatism. This at least is certain, that since my attention has been specially directed to this question, I have been enabled to trace a gouty or venereal taint in every case in which the eye has been inflamed in connection with presumed rheumatic gout. Nevertheless, I have not as yet obtained sufficient evidence to justify a positive opinion on the subject, and therefore have not thought it right to interfere with the text.

posed. The conjunctiva, the sclerotic, the choroid, and the iris, are all sometimes implicated before the disease is arrested; but more commonly, if the patient is under medical treatment, the choroid and the iris escape altogether. Very generally the inflammation commences in the sclerotic and spreads to the conjunctiva, and though not very violent, continues, in spite of treatment, for several days. Even when all symptoms of inflammation have been subdued, and the eye has regained its natural appearance, the morbid action is prone to recur without any manifest external cause. Rarely, however, unless grossly neglected, does the inflammation leave permanent ill-effects; nor does it require the same activity in its general treatment, nor the same amount of topical applications which would be necessary for its relief in ordinary cases. In some instances it may be deemed expedient to give calomel and opium, and to apply a blister behind the ear, or a few leeches to the temples, but more commonly opiate fomentations to the eyes, with cold applications to the temples, and derivatives, such as mustard poultices or mustard baths, to the feet; and internally, a brisk purgative, followed by an alkaline mixture containing colchicum, will be sufficient to effect our purpose. If the patient be very low, calomel given so as to produce ptyalism, aggravates rather than mitigates the disease, and in such cases the iodide of potassium and cinchona may be employed beneficially in combination with small doses of the liquor Hydrargyri Bichloridi. Indeed, in this, as in all similar instances, the symptoms must be combated on general principles, due regard being had to the nature of the disease in connection with which they have primarily arisen.

The following cases will serve to illustrate the treatment of some of the more obstinate forms of Rheumatic Gout.

Case 1.—On the 15th of November, 1855, I was asked by Mr. Nussey, of Cleveland Row, to meet him in consultation on the case of Miss —, a young lady, æt. 23, who for three years had been thoroughly crippled by rheumatic gout. One of her aunts had suffered from this complaint, but she had never before experienced any rheumatic symptoms. The attack had come on slowly and insidiously whilst she was apparently in the enjoyment of good health. Joint after joint became enlarged and painful, until at length there was hardly a joint in her body which was not frightfully distorted. Her spine was stiff, and could not be bent without much difficulty. Her neck was stiff, as were also the shoulders, so that she was unable to raise her arms to her head; the elbows, wrists, and both knees and ankles were much enlarged; the hands were distorted, and some stiffness existed in the hips. She had been under medical treatment throughout, and had consulted several physicians who had ordered Colchicum, Alkalies, Guaiacum, Iodide of Potassium, Sarsaparilla, Cod Liver Oil, Quinine, and many other remedies; and for two successive summers she had gone to the German baths in the vain hope of obtaining relief.

When I first saw her she was a perfect cripple; she could not walk, and was unable to get from her bed-room to the drawing-room without going upon “all fours.” She could not rise from her chair without a long and painful struggle. The skin was acting freely, almost too readily, on exertion, and was frequently covered with a cold clammy perspiration. Tongue coated; bowels rather costive; urine very scanty, and loaded with lithates, sp. gr. 1019. Catamenia regular, but too profuse. She had a fair appetite, and never suffered from indigestion, but, as is usual in such cases, she was becoming “low-spirited.” Heat op-

pressed her, and she was always in better health in cold than in hot weather. A pill containing two grains and a half of the acetous extract of *Colchicum*, a grain of *Ipecacuanha*, and enough of the *Ext. Aloes Aquosum*, to regulate the bowels was ordered to be taken every night, and another pill containing two grains of the *Pilula Hydrargyri* was administered as occasion required. A draught containing *Potassæ Acetatis*, ʒss, *Potassæ Carb.*, ℥i, *Potassii Iodidi*, gr. iv, *Ext. Taraxici*, ʒss, and *Tr. Cinchonæ co.*, ʒjss, was ordered to be taken three times a day with *Olei Morrhuæ*, ʒss. Gin or whisky and water was the beverage prescribed for dinner, and lemonade was also permitted, if she felt thirsty during the day. A shower bath of cold water, followed by prolonged and active friction down the spine, was ordered to be taken every morning, and an absorbent ointment, frequently repeated friction, and various mechanical movements were employed to get rid of the stiffness and chronic enlargement of the joints. Slow mastication and other accessories of good digestion were also specially insisted on.

In the course of a month some improvement began to manifest itself, and though from time to time some slight alteration was made in the medicine, the general plan of treatment remained the same. The chief alteration which was made consisted in the substitution of a strong infusion of the *Fraxinus excelsior* for the Tincture of *Cinchona*. Before the end of three months she was able to take a walk out of doors for half an hour, and after a steady perseverance of five months her general health had greatly improved; the swellings of the joints had almost wholly disappeared; the stiffness had greatly decreased, and she was on the high road to perfect recovery. I have not seen her for several months, but I hear from Mr.

Nussey that she has almost recovered her usual health and strength, though some of the joints remain permanently distorted.

Case II.—Jane Hardy, a married woman, æt. 30, was admitted under my care at St. George's Hospital on the 16th of June, 1855, suffering from rheumatic gout of two years' duration. She had been under treatment above eighteen months, and had taken many warm baths, but was not aware what remedies had been employed internally. When I first saw her, she was thin, pale, and cachectic in appearance; her feet, ankles, both wrists, and several of the finger joints were enlarged, swollen, and occasionally painful; the skin was dry, and unperspiring; indeed, if her own account was to be trusted, even a hot bath did not cause the slightest perspiration: tongue somewhat coated. Bowels regular. Catamenia regular, but scanty. Urine formerly turbid, but now usually clear, and rather scanty, sp. gr. 1020; appetite tolerably good. Is restless at night, and feels very weak and low-spirited.

I advised her to abstain from tea and malt liquor: to take gin or whisky and water at dinner; to have recourse to a vapour bath twice a week, and to employ a cold douche daily for her feet and ankles. An absorbent ointment was ordered for the joints, and the following medicines were also prescribed.

R Potassii Iodidi, gr. v;
Liq. Potassæ, ℥ xlv;
Tr. Guaiaci Ammoniatæ, ʒj;
Haust. Cinchonæ, ʒxss, ter die.

On the 14th of July, she was very little, if at all, improved. The vapour bath gave rise to excessive heat, fullness about the head, and excitement, but did not make her perspire, and the skin remained just as dry as before. The urine was more abundant and clear, but the other symptoms remained the same. The following addition was therefore made to the medicine, which was ordered to be taken soon after meals, viz. :—

Liquoris Potassæ Arsenitis, ℥viii;

and a cold shower bath was substituted for the vapour bath.

From this time her improvement was very marked, and steadily progressive. The skin began to perspire within three days after the first dose of arsenic had been taken, and by the 10th of August, the complexion had become clearer, the pains less constant and severe; the sp. gr. of the urine had increased to 1026, and she felt stronger and better in every respect.

From the 29th of September until the 27th of October, the arsenic was omitted by way of precaution, but at that date, as the skin's action was becoming sluggish, the use of the arsenical solution was resumed, and continued until the 24th of November, when I determined once again to try whether its disuse would lead to inactivity of the skin. At this time the pain and swelling of the joints of the upper extremities had wholly disappeared; the knees were no longer swollen, and the feet and ankles alone remained painful. She declared that her general health was better than it had been since the commencement of the attack, and that were it not for the pain in the feet, especially after walking, she should consider herself quite well.

The discontinuance of the arsenic had a marked effect in

diminishing the amount of perspiration, but as the skin still continued moist, I did not deem it necessary to have recourse to it again at present.

On the 5th of January she had a slight feverish attack accompanied by relaxation of the bowels, and as it was probably attributable to the long-continued use of the ammoniated Tincture of Guaiacum, the former draught was omitted, and the following prescribed :—

R. Potassii Iodidi, gr. v ;
 Liquoris Potassæ, ʒss ;
 Potassæ Acetatis, ʒss ;
 Ext. Sarzæ, ʒss ;
 Haustus Cinchonæ, ʒjss, ter die.

On the 19th of January, as the skin action was again becoming sluggish, the arsenical solution was added to the draught, and was persisted in until the 1st of March, when it was finally discontinued, the skin having acted freely ever since.

On the 26th of April, she was so well that it was no longer necessary for her to continue taking medicine, and I advised her going into the country for change of air, with the view of thoroughly re-establishing her health.

Case III.—On the 18th of October, 1853, I was consulted by Miss W—, æt. 21, who, at the recommendation of Mr. Neville, of Esher, had been brought to London to be placed under my care. She had been suffering above a year and a half from rheumatic gout, which, though at first confined to the wrist and the small joints of the fingers, had gradually extended the range of its attacks, until few, if any, of the joints had escaped.

When she first applied to me she was a perfect cripple,

and unable to raise her hand to her head; the shoulders, elbows, and wrists, were swollen, stiff, and painful; the small joints of the fingers were distorted, the knees and ankles were painful, and she suffered from pain and stiffness of the neck. The symptoms first manifested themselves at a time when she was apparently in good health; but with the progress of the disease the general health had failed, and she had become thin, weak, dyspeptic, and low-spirited. Her circulation was very languid; the extremities were almost always cold; the pulse 74, feeble; the tongue white and coated; the bowels regular in action, but the motions often pale or else dark-coloured and offensive: the monthly periods regular; the urine scanty, turbid, acid, sp. gr. 1018; the skin usually damp, with a cold clammy perspiration.

She had taken large quantities of iodide of potassium, colchicum, and other remedies, without the slightest relief, and had had a succession of hot baths with the same result. The manifest want of tone in the system led me to recommend a tonic and alterative plan of treatment. A cold shower bath was ordered to be taken daily, and to be followed by active friction down the spine; an absorbent ointment was ordered for the joints, and the following medicines were prescribed:

- . R Hydrargyri Chloridi, gr. xij;
 Extracti Aloes Aquosi;
 Extracti Colchici Acet., āā ʒj.
- M. ft. Pilulæ duodecim quarum sumatur una omni alternâ nocte.
 Liquoris Potassæ, ʒiiss;
 Tincturæ Guaiaci Ammon., ʒij;
 Extracti Sarzæ, ʒiiss;
 Tincturæ Cinchonæ co., ʒiij;
- M. ft. mistura, cujus sumatur cochlearium unum magnum e
 cyatho aquæ vinario ter die.

Malt liquor and wine were interdicted; a light but generous diet enjoined, and gin or whisky and water recommended as a beverage at dinner.

After eight weeks' steady perseverance with this treatment, very decided amendment was manifest. The general health was beginning to improve; she suffered far less from dyspepsia and depression of spirits; her complexion was clearer; the tongue moister and less coated; the urine more abundant, though still turbid; the bowels were regular, and the motions of a more healthy character; the joints were much less swollen, and, with the exception of the right wrist, were no longer painful.

On the 9th of December, 1853, fifteen grains of the Pil. Rhei c. were substituted for the calomel, and the pills and medicine were continued as before.

From this date until the 21st of June, 1854, this plan of treatment, with slight modifications, was steadily persevered in. By that time she was in good health and spirits, could take a long walk without inconvenience, and could dress and otherwise assist herself, though some stiffness of the shoulders still remained, and the wrists occasionally evinced symptoms of irritation. The urine was now abundant and clear; the bowels regular, the motions healthy. The pulse, however, remained weak, and she was still somewhat thin; so I ordered her to take twice a day, with half an ounce of cod-liver oil, a draught containing Potassæ Bicarb., ℥j.; Ammoniæ Sesquicarb., gr. v.; Tincturæ Quinæ, ʒj. At the same time, active friction, with stimulant embrocations and absorbent ointments, were prescribed for the shoulders.

From this time onwards her progress was steady and satisfactory in every respect, and so well did she feel, that ere long she gave up physic, and went on a visit to a married sister at Oporto.

Case IV.—William Collins, æt. 39, a printer by trade, was admitted a patient under my care at St. George's Hospital, on the 4th of March, 1856. At the age of 24 he was profusely salivated for the cure of syphilis, and had ever since suffered more or less from rheumatic gout, principally affecting the small joints of the hands, the wrists, and elbows. The disease was at first confined to the joints of the fore and middle fingers of the right hand, but had gradually extended to other parts, until, when he came under my care, almost every finger was enlarged, stiff, and incapable of being bent. He said that he did not experience much acute pain, but suffered constantly from aching stiffness of the joints, was incapable of and thoroughly indisposed for work, and felt low, irritable, and restless. He was thin, and cachectic in appearance; his tongue was almost clean; bowels reported regular; urine either pale or else scanty and turbid; appetite indifferent.

Steaming and friction, with absorbent and stimulating applications, were ordered for the joints, and the following medicines prescribed:

R. Extracti Colchici Acet., gr. ij., omni nocte.

Potassii Iodidi, gr. vj;

Potassæ Bicarbonatis, 3ss;

Potassæ Acetatis, ʒj;

Olei Morrhuæ, ʒiv;

Infusi Calumbæ, j., ter die.

By the 1st of April a sensible improvement had taken place. The joints were more flexible; the urine was more abundant and clear; there was less aching in the joints; and he felt in better spirits.

The medicines were therefore continued.

By the 22d of April more decided progress had been made. He no longer experienced any pain; the joints

were decidedly smaller and more flexible ; the appetite was good ; and the water abundant and quite clear. He was still pale ; so the following draught was ordered in lieu of that he had hitherto taken :

R. Potassii Iodidi, gr. vj ;
Syrupi Ferri Iodidi, ℥j ;
Olei Morrhuæ, ℥iv ;
Infusi Calumbæ, ℥vij, ter die.

The pill was repeated as before.

Under this treatment the general health improved, the joints decreased in size and became more flexible, and he was enabled to resume his occupation as a printer. On the 20th of May he went into the country, and from that time I lost sight of him.

TABLE

Exhibiting the Temperature and Constituents of various Thermal Springs.

BUXTON WATER.

Analysis by Dr. Lyon Playfair.

Water clear, sparkling, inodorous.

Temperature—82° Fahrenheit ;
sp. gr. 1·0003.

Solid contents of a Gallon :

	grs.
Silica . . .	0·666
Oxide of Iron and Alumina	0·240
Carbonate of Lime . .	7·773
Sulphate of Lime . .	2·323
Carbonate of Magnesia	4·543
Chloride of Magnesium	0·114
„ Sodium . .	2·420
„ Potassium . .	2·500
Fluorine	
(as Fluoride of Calcium)	trace
Phosphoric Acid	
(as Phosphate of Lime)	trace
	<hr/>
	20·579

*Gaseous contents according to
Volume :*

Carbonic Acid . .	1·167
Nitrogen . .	98·833
Oxygen . .	trace
	<hr/>
	100·000

At the moment of issue the water
contains 206 cubic inches of
Nitrogen per gallon.

WOODHALL SPA.

Wood Hall, near Horncastle,
Lincolnshire.

Analysis by Mr. West, of Leeds.

Temperature—55° Fahrenheit ;
sp. gr. 1016.

Solid Contents of a Gallon :

	grs.
Chloride of Sodium .	1517·00
„ Calcium .	27·00
„ Magnesium	11·00
Bicarbonate of Soda .	6·00
Sulphate of Soda .	2·00
Bromine . .	8·48
Iodine . .	·50
	<hr/>
	1571·98

Gaseous contents :

Nitrogen . . cub. inch.	20
Carbonic Acid . .	18
Carburetted Hydrogen .	4·50
Sulphuretted Hydrogen	trace

HARROGATE WATERS.

Analysis by Professor Hofmann.

Old Sulphur Well.

Temperature—48·2° Fahrenheit.
sp. gr. 1·01113.

*Grains of Saline constituents in a
Gallon :*

Sulphate of Lime	. 182
Carbonate of Lime	. 12·365
Chloride of Calcium	. 81·735
„ Magnesium	55·693
„ Potassium	64·701
„ Sodium	. 866·180
Sulphide of Sodium	. 15·479
Silica	. 246
	<hr/>
	1096·580
	<hr/>

Fluoride of Calcium, Bromide of Sodium, Iodide of Sodium, Ammonia, Carbonate of Iron, and organic matter, of each a trace.

Sulphuretted Hydrogen Gas, 26·9 cubic inches.

DROITWICH SALINE
BATH.

Analysis by Mr. Herapath.

Solid contents of a Gallon :

	grs.
Chloride of Sodium	21,761·872
„ Magnesium	2·560
Sulphate of Lime	91·120
„ Alumina	14·400
„ Soda	342·720
Iodide of Sodium	·208
	<hr/>
	22,212·880
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BATH WATERS.

*Analysed by Merck & Galloway,
in 1848.*

King's Bath Spring.

Temperature—115° Fahrenheit;
sp. gr. 1·0025.

Contents of an Imperial Gallon :

Carb. of Lime	. grs. 8·820
„ Magnesia	. 329
„ Iron	. 1·071
Sulphate of Lime	. 80·052
„ Potassa	. 4·642
„ Soda	. 19·229
Chloride of Magnesium	14·581
„ Sodium	. 12·642
Silicic Acid	. 2·982
	<hr/>
	144·018
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Carbonic Acid, 26·45 cub. inches.

BARÈGES WATER.

Temperature, about 120° Fahr.

Contains :

Sulphide of Sodium.
Carbonate of Soda.
Sulphate of Soda.
Chloride of Sodium.
Nitrogen.
Free Sulphuretted Hydrogen
Animal Matter.

AIX LA CHAPELLE.

*Analysis of the Kaiserkelle**(Source de l'Empereur), by Liebig.*

Temperature—131° Fahrenheit ;
sp. gr. 1.0034.

Contains in a Pint, of 16 oz. :

Chloride of Sodium	grs. 20.270
Carbonate of Soda	. 4.995
Sulphate of Soda	. 2.171
Sulphate of Potassa	. 1.186
Carbonate of Lime	. 1.217
„ Magnesia	.395
„ Iron	.073
„ Strontia	.001
„ Lithia	.002
Bromide of Sodium	.027
Iodide of Sodium	.004
Sulphuret of Sodium	.072
Silica	.507
Organic Matter	.577
	<hr/>
	31.497
	<hr/>

*Gaseous contents according to
Volume :*

Absorbed in the Water :

Nitrogen	. 9.00
Carbonic Acid	. 89.40
Bihydroguret of Carbon	.37
Sulphuretted Hydrogen	.00
Oxygen	. 1.23

Free and rising in the Water :

Nitrogen	. 66.98
Carbonic Acid	. 30.89
Bihydroguret of Carbon	1.82
Sulphuretted Hydrogen	.31
Oxygen	.00

WIESBADEN WATER.

Analysis by Fresenius.

Temperature of Kockbrunnen
Water, 158° Fahrenheit.

Contains in a Pint :

Chloride of Sodium	grs. 52.497
„ Potassium	. 1.119
„ Lithium	.001
„ Ammonium	.128
„ Calcium	.617
„ Magnesium	.566
Sulphate of Lime	.692
Carbonate of Lime	.210
„ Magnesia	.079
„ Protoxide of Iron	.043
	<hr/>
	55.952
	<hr/>

With traces of Iodine, Bromine, Arsenic, Alumina, Strontia, Copper, Manganese, Baryta, Silica, and organic matter, bringing the solid contents of a Pint up to 63.457 grains.

Carbonic Acid free and combined with Car- bonates	. 3.903
Nitrogen	.015

BADEN BADEN WATER.

Analysis by Kastner.

Temperature of Ursprung, about
120° Fahrenheit.

A Pint contains :

Chloride of Sodium	grs. 17.500
„ Calcium	. 1.500
„ Magnesium	.500
Sulphate of Lime	. 2.750
Carbonate of Iron	. .111
	<hr/>
	22.361
	<hr/>

Free Carbonic Acid, .5 cub. inches.

TEPLITZ WATER.

*Analysis by Ambrozzi.**Temperature*—114° Fahrenheit.*A Pint contains :*

Sulphate of Soda	. grs. 1.696
Chloride of Sodium	. .776
Carbonate of Soda	. 12.240
„ Lime	. .340
Silica420
Extractive100
Carbonate of Iron	. .036
	<hr/>
	15.608
	<hr/>

Free Carb. Acid, 2.4 cub. inches.

CARLSBAD WATER.

*Analysis of the Sprudel,
by Berzelius.**Temperature*—167° Fahrenheit.*Sixteen Ounces contain :*

Chloride of Sodium	grs. 7.975
Sulphate of Soda	. 19.869

Carbonate of Soda	. 9.695
„ Lime	. 10.050
„ Magnesia	1.370
„ Iron	. .028
Silica577
	<hr/>
	43.564
	<hr/>

With traces of Manganese,
Strontia, and Alumina.

Free Carb. Acid, 11.8 cub. inches.

WILDBAD WATER.

*Analysis by Sigwerth.**Temperature*—98° Fahrenheit.*Sixteen Ounces contain :*

Chloride of Sodium	grs. 1.820
Sulphate of Soda	. .400
Carbonate of Soda	. .530
„ Lime	. .340
„ Magnesia	.070
Sulphate of Potash	. .020
Silica390
Oxide of Iron	. .020
„ Manganese	. .020
	<hr/>
	3.610
	<hr/>

*Gaseous contents according to
Volume :*

Carbonic Acid	. 2.00
Oxygen 6.50
Nitrogen 91.50
	<hr/>
	100.00
	<hr/>

VICHY WATERS.

ANALYSIS BY MONS. BOUQUET.

Contents of a Litre of Water expressed in grammes.

Constituents of the Vichy Waters.	Grande Grille.	Hôpital.	Célestins.	Hauterive.	Des Dames.
Carbonic Acid	0·908	1·067	1·299	2·183	1·908
Bicarb. of Soda	4·883	5·029	4·101	4·687	4·016
„ of Potass	0·352	0·440	0·231	0·189	0·189
„ of Magnesia	0·303	0·200	0·554	0·501	0·425
„ of Strontia	0·003	0·005	0·005	0·003	0·003
„ of Lime	0·434	0·570	0·669	0·432	0·604
„ of Protoxide of Iron	0·004	0·004	0·004	0·017	0·026
„ of Protoxide of Manganese	A trace	A trace	A trace	A trace	A trace
Sulphate of Soda	0·291	0·291	0·314	0·291	0·250
Phosphate of Soda	0·130	0·046	A trace	0·046	A trace
Arsenate of Soda	0·002	0·002	0·003	0·002	0·003
Borate of Soda	A trace	A trace	A trace	A trace	A trace
Chloride of Sodium	0·534	0·518	0·550	0·534	0·355
Silica	0·070	0·050	0·065	0·071	0·032
Organic Matter, Bituminous	A trace	A trace	A trace	A trace	A trace
	7·914	8·222	7·865	8·946	7·811
Temperature . {	105° Fah.	87° Fah.	55° Fah.	58 to 61° Fah.	cold.

CHAPTER XII.

ON CHRONIC RHEUMATISM.

WHEN describing the symptoms of acute rheumatism, I remarked on the difference of the structures affected in different cases, and pointed out the reasons which induced me to classify all the varieties under one comprehensive title. I stated that, although in some instances one texture or one part of the body may be principally if not exclusively affected, yet that much more frequently the different forms of the disease coexist to some extent in the same individual, or at least pass rapidly the one into the other, thus not only asserting the identity of their origin, but rendering a classification, founded simply on anatomical peculiarities, inconsistent with the pathological phenomena. The same reasons may be urged with equal propriety against the distinctions which have been drawn between the varieties of the disease as they are met with in a chronic form. In some instances the fibrous structures about the joints, in some the capsular membrane lining the joints, in some the fibrous envelopes of the nerves, and in others the muscles with the aponeurotic sheaths, the fasciæ and tendons, or the periosteum in various parts of the body, may be more conspicuously affected; but occasionally one variety lapses into another, and a fibrous rheumatism may thus, after a time, be complicated or replaced

by synovial symptoms, and may ultimately terminate in sciatica, or some other form of neuralgic pain, or in rheumatism affecting the muscles only.

Whether, then, in an acute or chronic form, the disease is always one and the same, acknowledging the same origin, though varying in its type according to the age and constitution of the patient, the quantity of the poison present in the system, and a variety of other modifying circumstances.¹ Whatever its precise character, however, the acute may pass into the chronic form, and the chronic may light up into an active state, and present the symptoms of the acute disorder. These are facts of every-day experience, and receive constant illustration in the wards of every large hospital. But, according as the disease is acute or chronic, a remarkable difference is usually observed in the parts principally affected. Thus, an acute attack is often ushered in by wandering pains, which are chiefly if not wholly confined to the muscular structures; but no sooner are the acute symptoms developed, than the muscular pains subside, and the joints are chiefly if not solely affected. So, again, when all acute symptoms have disappeared, not only does there remain a stiffness or a dull aching pain in the joints, but the muscles in various parts of the body are often more or less implicated. The patient suffers from pain and stiffness in the

¹ In making this statement, I do not wish to imply that, in all cases of so-called chronic rheumatism, the disease is identical in its nature and origin with true rheumatism. On the contrary, it is my firm conviction that several distinct diseases, acknowledging different origins, and attributable to different morbid poisons, are usually included under the title of chronic rheumatism. I only wish it to be understood that true rheumatism is the same disease, and is traceable to the same source, whether it assumes an acute or chronic form, or affects one or other tissue of the body.

shoulders, or across the loins, or finds himself unable to move his hip, in consequence of pain which he experiences in the muscles whenever he attempts to do so. Thus, whatever the cause of this peculiarity, the fact of its existence admits not of doubt. The articular structures are the parts most commonly affected in acute rheumatism ; the muscles, their fasciæ and tendons, more generally suffer in the chronic form of the disease. The muscles may be, and sometimes are, implicated in the acute disease, and the joints in like manner are not unfrequently attacked during the chronic stage of the disorder ; but the distinction just alluded to holds good so generally, that in practical importance muscular rheumatism ranks far above all other forms of the complaint, as it occurs in a chronic state.

Chronic rheumatism, then, may be either a sequel of an acute attack, or may commence at once as an idiopathic disorder, and preserve this character from first to last. In the former case the joints are rarely free from pain ; in the latter they frequently escape altogether. In both instances, however, the disease is characterized by a dull aching or uneasiness, which is aggravated or quickened into agonizing pain by sudden motion of the affected parts, and subsides in some measure after perfect rest. It is rarely accompanied by local heat or redness, and seldom by œdema or by effusion into the joints ; and even when articular swelling does occur, it is unattended by active febrile disturbance. The boundary line, however, between chronic rheumatism and that more active form of the disease which, in the severity of its symptoms, is intermediate between it and acute rheumatism, is often very faintly marked, and thus it sometimes becomes difficult to decide whether a case should be designated chronic rheumatism, or whether it ought not more properly to be classed among those which, as holding an intermediate position, have been entitled cases

of sub-acute rheumatism, and have been treated in accordance with their *sub-acute* character.

One of the forms in which chronic rheumatism most frequently presents itself in practice is that of lumbago.¹ The patient who has suffered perhaps from little else than stiffness in various parts of the body, is seized with pain and aching across the loins. So long as he remains quiet, he enjoys comparative immunity from suffering; but he undergoes torture whenever, in an unguarded moment, he bends or twists his body, or forgets to observe due caution in moving. Is he lying in bed at the time of his seizure? he finds it difficult to raise himself into a sitting posture: is he seated in a chair? he finds it equally difficult to rise on to his feet: and if standing erect, he rarely finds it an easier task to assume a sitting or recumbent posture. To stoop forward is impossible, so agonizing is the pain induced in the muscles and fasciæ of the back, which are thus called into action.

When the attack is severe, the unfortunate sufferer may be obliged to remain in bed, or to lie on the sofa, for several successive days; and, in such cases, there is usually some amount of constitutional disturbance, marked by a coated tongue, acceleration of the pulse, and acid, dark-coloured, or loaded urine. Even when the attack is less severe, it calls no less urgently for relief. For although, in the first instance, the general health may suffer little, the patient can never walk without difficulty, is frequently unable to raise himself into an erect position, and is quite incapacitated for the active duties of life. Moreover, the disease, though not very severe, is apt to be exceedingly obstinate; and, if

¹ The terms "form" and "variety" are employed as implying simply a difference in the seat, and not in the real nature, of the disease.

neglected at first, may linger on for weeks or months in spite of any treatment which may be subsequently adopted.

Another most annoying form of the disease, which is frequently induced by exposure to draughts, is that which affects the muscles of the neck, and constitutes the complaint which is commonly known by the appellation of a "stiff" or a "wry" neck. The pain is much the same as that which characterises lumbago, and like it is induced or aggravated by motion. At first it may yield readily to appropriate treatment; but sometimes, when neglected, it continues obstinately fixed in one particular spot, and then may give rise to distressing consequences. To relax the parts, and so lessen the pain which is caused by the tension of the affected muscles, the patient either holds his head awry, or bends it towards the affected side; and whilst in this position, so much rigidity of the muscles may ensue, as to render it difficult for him to regain his former posture. Such cases are rare; and, in my experience, have only occurred after repeated attacks, or where the disease has been grossly neglected; but they are sufficient to warn us to lose no time in hastening to our patient's relief.

Another variety is that which is known as "intercostal" rheumatism. The parietes of the chest, like other parts of the body, are liable to be attacked by the rheumatic poison; and like them too, when attacked, become exquisitely painful. Motion greatly aggravates the pain. Hence the suffering is increased by the act of inspiration; and the "stitch" which thus results, and which in many respects resembles the stitch of pleurisy, has led to serious mistakes in practice. The patient has been bled, and leeches, and blistered, when no antiphlogistic remedies were required. But intercostal rheumatism may be readily distinguished from the pain of pleurisy by the absence of fever which usually marks the invasion of that disease; by the absence of

cough and other symptoms of pulmonary irritation ; by the tenderness which is evinced on external pressure ; by the freedom from pain on pressure upwards under the short ribs ; by the increase of pain which results from raising the arm above the head ; by the relief afforded when the ribs are fixed, and the intercostal muscles are thus kept at rest ; and by the absence of those physical signs of pleurisy which are obtained by percussion, and by the careful use of the stethoscope.

When the disease fixes itself for some length of time in any particular part, as in the muscles of the thigh or arm, it not only occasions pain, but leads to atrophy and wasting of the limb. It does so, not by any change induced in the structure of the parts, nor by any special influence which it exerts over their nutrition, but simply by occasioning such disuse of the muscles, as naturally leads to their gradual attenuation. Anxious to avoid the pain attendant upon any movement of the affected structures, the sufferer learns to keep them at rest ; and thus, after a time, their nutrition takes place less actively and less perfectly, and they waste, and become gradually weaker and smaller. In all such cases, therefore, though pain be induced at first, much benefit will ultimately result from moving and exercising the affected limbs, as also from employing electricity and friction, and submitting to that more active process of rubbing and kneading which is commonly known as shampooing.

When the structures which enter into the formation of the joints are affected by chronic rheumatism, pain of greater or less intensity ensues, and varies in its character according to the nature of the parts affected. Very generally the ligaments, and their fibrous structures immediately surrounding the joints, are the parts principally if not solely implicated ; and then the old term of "*dolor articulorum*"

represents the extent and character of the affection. There is neither swelling, nor heat, nor redness, but there is a dull aching of the joints, which, when roused and excited by sudden motion, is converted into pain of a distressing kind, which sometimes wears off or diminishes in intensity after the parts have been kept some time in exercise.

When the bursæ and the synovial membrane lining the joint become the seat of irritation, and effusion takes place into their cavities, the pain is usually less severe and less constantly aggravated by sudden motion; but it is more certainly increased by continued exercise, and is most felt when the limbs are in those positions in which the irritated membranes are put upon the stretch. Thus, when there is effusion into the capsular membrane of the knee, pain is sure to be induced by full flexion of the leg, and is greatly relieved by keeping the limb in a horizontal position, and straight, or very slightly flexed. And when the bursæ and the adjoining tendinous sheaths are the seat of effusion, any action which tends to bring the parts into play is certain to be accompanied by an increase of suffering. The wrist is one of the common situations of these enlarged bursæ, and excessive pain is sometimes occasioned by long-continued use of the affected joint and of the tendons connected with it. In the chronic state, however, which I am now describing, although the swelling may be considerable, there is no remarkable febrile disturbance, no discoloration of the skin, and but little if any perceptible increase of local action.

One form of the complaint, which is apt to prove extremely obstinate, is that which arises in sequel of urethral discharge. Generally, about the third day of the discharge, the patient feels chilly, and is seized with pain in one or more joints, accompanied by excessive synovial effusion, and by inflammation of the ligaments and the adjoining bursæ and sheaths of tendons. Coincidentally with the occurrence

of articular mischief, the discharge sometimes ceases; but more generally it only decreases in quantity, and a gleety discharge continues throughout the attack. At first there may be more or less febrile disturbance, but this soon passes off; and though the patient remains crippled by pain and swelling of his joints, and by exquisite pain in the tendons and fasciæ whenever he attempts to move, yet his tongue is often clean, his bowels regular, his urine clear, the pulse quiet, the appetite good. These peculiarities, together with the severity of the pains, the obstinacy of their continuance, and the proneness which is manifested to inflammation of the eyes, constitute the chief characteristics of this form of disease.

I have never known this malady to occur except in persons who were either suffering from urethral discharge, or who—it may be years before—had experienced an attack of rheumatism during the existence of gonorrhœa.¹ But I have so often seen it recur in such persons, coincidently with or shortly after the appearance of a slight gleety discharge, which, as far as I could ascertain, was excited solely by excessive sexual intercourse and an undue amount of alcoholic stimulants, that I cannot doubt the predisposition, which exists in persons who have once experienced an attack, to a recurrence of articular symptoms on the slightest irritation of the urethra.

Some persons have maintained that this form of disease is nothing more than ordinary rheumatism excited in a gouty habit, and they have referred to the excessive synovial

¹ Though I make use of the term gonorrhœa, in connection with this form of rheumatism, my conviction is that so-called gonorrheal rheumatism arises in connection with a urethral discharge, which is essentially distinct from that which accompanies ordinary gonorrhœa, and is excited by a peculiar and comparatively rare form of vaginal poison.

effusion, the frequency of inflammation of the eyes, and the constant recurrence of the disease coincidently with slight gleetly urethral discharge, but without any evidence of active gonorrhea, in support of their position. My own opinion, however, is opposed to this view. The persons in whom it occurs are often young, slim, and of active habits, who have neither inherited a predisposition to gout, nor acquired the tendency by their own mode of living: the big toe, which is almost always affected in gout, is rarely so in this form of malady; and colchicum, which exerts a marked influence over gout, is powerless to restrain the course of this disease, or to modify its intensity. So also are the medicines ordinarily given for the cure of rheumatism. Indeed, I feel persuaded that it has no connection with true gout or true rheumatism, but is a disease *sui generis*, engendered by a specific poison, and requiring a special mode of treatment.

There is yet another form of rheumatism which is apt to occur in cachectic conditions of the system, and is well deserving of especial notice; I mean that known as periosteal rheumatism. In those parts of the body where the bony frame-work is thinly covered with integument, the periosteum, the fibrous investment of the bones, becomes painful, tender on pressure, and thickened so as to cause distinct projections. Thus nodes, as they are called, are often formed on the tibia, the ulna, the clavicle, the sternum, and the cranium. At the first onset of the disease, the part affected may become somewhat swollen and puffy; but as the puffiness subsides, the thickening to which I have alluded ensues, and forms firm, irregular, painful elevations, exquisitely tender to the touch. So prominent are they in some instances, that the eye alone suffices to detect their existence, and even when this is not the case, they are easily felt on running the fingers along the bone. They vary

in size, as in prominence, roughness of surface, and tenderness, but they are usually of an inch or an inch and a half in length, sufficiently tender to be a constant source of pain and annoyance, and prominent enough, and rough enough, to be detected on the most cursory examination.

When they occur on the shin-bone, on the breast-bone, or the collar-bone, they are easily recognised, and their nature is not very liable to be mistaken, but their occurrence on the forehead, or other parts of the cranium, gives rise to a severe and wearing pain, which is often mistaken for ordinary headache, and being improperly treated as such, proves exceedingly obstinate and intractable. Patients suffering under this form of disease have repeatedly come under my care at the Hospital, who, for months, have been undergoing treatment for headache or neuralgia without deriving the slightest benefit, and in almost all such cases immediate relief has been experienced when the true nature of their complaint has been discovered, and appropriate treatment pursued.

This form of the disease is frequently described as occurring only among those who are tainted with venereal poison, or whose systems are saturated by mercury. Nothing, however, can be more erroneous than such a statement. True it is, as already stated, that this form of the complaint is most common in cachectic states of the system, and is, therefore, met with most frequently—nay, *almost* exclusively—among those who have been depressed by the operation of the syphilitic poison, or by long-continued mercurial action. But it is not *necessarily* confined to cases of this sort. I have known inflammation of the periosteum occur during the course of a well-developed attack of acute rheumatism, and on several occasions have met with nodes in persons among whom I am convinced no such

agencies had been at work, and in some of whom it is morally certain they never could have been. Even the existence of a cachectic state of system does not seem to be a condition *essential* to its development, though the disease is certainly most common among, nay is usually confined to, those in whom a state of cachexia exists.

The pains in chronic as in acute rheumatism are usually most severe at night ; so much so, indeed, that in many instances, after the first stiffness has worn off in the morning, they occasion little inconvenience until the patient is again in bed. These nocturnal exacerbations have been attributed by some to the agency of heat, and the warmth of the bed has been thus made answerable for the manifest increase in the patient's sufferings. But although increased warmth is sometimes accompanied by an increase of pain, yet at others it tends decidedly to its alleviation ; and the fact that an exacerbation of symptoms towards night is equally well marked in many other disorders, occurs under every condition of external temperature, and is observed as decidedly when the sufferers do not go to bed as when they are lying under a load of blankets, is decisive as to the incorrectness of the opinion which would attribute this peculiarity to warmth.

That, in many cases, the pain is aggravated by heat, whilst in others it is relieved by the same means and to an equal extent, is a matter of common every-day experience, and theoretically is a fact possessing little value. It accords precisely with the observation which has been made in many complaints in which pain is a prominent feature, namely, that warmth or tepid applications are more grateful in one instance or at one period of the disorder, whilst cold ones are more grateful and more serviceable at another. But in practice its importance is strikingly manifest, and has been

recognised ever since the days of Aretæus. The cases which benefit most from warmth are those which occur chiefly among persons of a languid constitution; and in such persons friction and stimulating embrocations, together with hot baths, and the internal administration of stimulant and sudorific medicines, prove eminently serviceable, and therefore should be resorted to without delay. But in those in whom an increase of temperature is productive of suffering rather than of relief, the system has usually appeared more prone to become heated, and to take on inflammatory action. In such, therefore, stimulants should be avoided, and the same principles of treatment adopted as in the acute disease, though, of course, proportioned to the energy and general character of the symptoms.

It should be remembered, however, that even when a dry heat is prejudicial to the patient, and greatly increases the severity of his pain, any remedy which gives rise to free perspiration is often exceedingly serviceable. In this, as in the more acute form of the disease, I have repeatedly observed and pointed out to the pupils at the Hospital, how a patient who has bitterly complained of the heat which irritated and excited him, so long as the action of the skin was suppressed, has willingly admitted the relief afforded by a copious perspiration, resulting from a further increase of temperature induced by a vapour or a hot-air bath. If his pains have not been permanently removed, they have at least been subdued or mitigated for a time.

In the treatment of chronic as of acute rheumatism, it should be remembered that the disease is engendered by a poison resulting from imperfect or faulty assimilation, and that no cure can be permanent until the materies morbi already generated has been eliminated from the system, and the further formation of such matter arrested. The judi-

cious practitioner should constantly bear in mind how complicated is the machinery which is out of order, how closely one part of it hinges upon another, and how necessary it is for the cure of his patient that every part should work efficiently. He should endeavour to invigorate the system and restore a normal state of assimilation; he should mark each deviation from the condition of health, whether indicated by the tongue, the pulse, or the skin, by the urine, or the alvine evacuations, and according as the derangement seems general or local, so should he vary and apportion his remedies. Above all he should promote a free evacuation through the various channels by which the effete materials of the body are thrown out of the system; he should stimulate the skin to the function of perspiration; he should regulate the action of the kidneys and bowels; and should endeavour so to modify their several secretions as that every noxious matter shall be got rid of without exhausting or depressing his patient.

One of the remedies which has been found most effective for this purpose, is the ammoniated tincture of guaiacum, either alone or in combination with bark. Ever since the year 1781, when Dr. Dawson published the successful termination of his cases treated by half-ounce doses of this medicine, it has been an established favorite with the profession; and in the cure of chronic rheumatism, occurring in persons of a languid state of system, its efficacy is quite equal to its reputation. But it is seldom necessary, or indeed expedient, to administer it in such full doses as have been given and recommended by some practitioners. Dr. Elliotson, for instance, "has known patients who took six drachms three or four times a day;"¹ and many persons,

¹ Mason Good's 'Study of Medicine,' vol. ii, p. 281. Note by Samuel Cooper.

following Dr. Dawson's example, have given it in half-ounce doses. My own experience has led me to consider a drachm or a drachm and a half of the tincture, taken three times a day, an ample dose in ordinary cases; and even where this has failed in affording relief, it has never been necessary, nor has it seemed expedient, to exceed two drachms three or four times a day. In doses such as these it usually acts as a stimulating evacuant, increasing the action of the skin, the kidneys, and the bowels; and in such doses, should it produce a tendency to diarrhœa, its action may be controlled, and the bowels regulated, by the exhibition of opium. But in larger doses its action is more uncertain. Dr. Elliotson, whilst asserting that "when internal stimulants are necessary in rheumatism, he thinks this one of the best," acknowledges that, when given in large doses, "it often purges *violently*, and sometimes produces the nettlerash;"¹ and although no serious consequences may ensue, yet the possibility of the occurrence of such troublesome symptoms is enough to make us pause before adopting such a plan of treatment.

The volatile tincture is particularly useful in chronic rheumatism from the ease with which, if tonics be required, it may be combined with bark and other similar medicines. But the Mistura Guaiaci, to which I alluded when considering the treatment of acute rheumatism, is also a form in which guaiacum may be employed advantageously; the more so, when it is thought desirable to administer it freely without the quantity of the diffusible stimulant which is contained in the larger doses of the tincture.

There is yet another form, however, in which guaiacum has earned a well-merited reputation; I mean in powder,

¹ Loc. cit.

as existing in the compound formerly well known by the title of the "Chelsea Pensioner." The original recipe is given below;¹ and in these, or in somewhat varying proportions, this medicine has repeatedly effected a cure after all other preparations have been tried in vain. In most instances, however, the proportion of guaiacum may be advantageously increased, and when the bowels are costive, fifteen, twenty, or even thirty grains may be given at a dose. It is especially useful in old lingering cases, accompanied by torpor of the intestinal secretions, and a sluggish inactive condition of the skin.

On the same principle as that on which guaiacum has been recommended, many other remedies of a warm and stimulating nature have been administered in obstinate lingering cases. Among these may be mentioned, Camphor, the oils of Turpentine, Cajeput Juniper, Sassafras, and Amber, the balsams of Copaiba and Peru; and aromatic and pungent plants, such as mustard, horseradish, and the Arnica Montana.² Mezereon is sometimes used, and Senega and Dulcamara have also been recommended. All these agents, either alone or in combination with opium, which often proves a valuable adjunct, have been found extremely serviceable, and none more so than oil of turpentine. Indeed, many of the medi-

¹ Take of Flowers of Sulphur, ʒij;

Cream of Tartar, ʒj;

Powdered Rhubarb, ʒij;

Guaiacum, ʒj;

Clarified Honey, lb. j;

One Nutmeg finely powdered. Mix the ingredients.

Two large teaspoonsful to be taken night and morning, and to be persevered in until the whole is consumed. For the first three nights, a large tumbler of warm rum and water to be taken at bedtime, or if fever be present, white wine instead of rum.

² For formula see p. 365.

cines just enumerated are of a terebinthinate nature, and were it not for its nauseous flavour, and for the strangury which often follows its use, the common oil of turpentine, administered in drachm or half-drachm doses, would be very generally adopted as a cure in obstinate and protracted cases. In combination with bark, I have sometimes known it particularly useful.

Sassafras is a remedy which is seldom given in this country, except in the combination which finds a place in our Pharmacopœia under the title of Decoctum Sarzæ Compositum. I am satisfied, however, that it may be administered advantageously in many instances in which sarsaparilla is not needed, and in doses exceeding those in which it is taken in the Pharmacopœia preparation just alluded to. When the circulation has been languid, the skin dry, and the kidneys, liver, and bowels inactive, as they are in many forms of chronic rheumatism, the greatest benefit frequently results from its use either alone or in conjunction with any other remedies which the circumstances of the case may seem to require. It is stimulant and sudorific in its action, and in certain instances appears to exercise a curative influence, which is not possessed by guaiacum nor by any other remedy of the same class. Moreover, it is not purgative like guaiacum, and, consequently, is available in many instances in which the administration of that medicine is inadmissable.¹

Whenever it is given, diluents, such as hot weak tea,

¹ The subjoined formula is one which may be employed :

R. Sassafras Radicis concisi, ʒiiss ;
Mezerii, ʒiv ;
Taraxici Radicis concisi, ʒiij ;
Aquæ ferventis, Oj.

Macera per horas tres et cola. Dosis Liquoris colati, ʒj to ʒiiss.

barley water, or even plain water, should be taken plentifully, with the view of promoting diuresis and perspiration; and this applies not only to the whole class of stimulating and sudorific medicines of which this is one, but also to the saline medicines, which in rheumatism and rheumatic gout are given as alteratives and eliminatives. There cannot be a doubt that free dilution exercises a most important influence on the action of almost all the remedies which prove useful in this class of disorders, and that a dose which would excite nausea and irritation of the stomach when taken in a concentrated form, is often productive of excellent results when aided in its action by water. Hence, probably, the wonderful efficacy of the natural mineralized waters, and hence, also, the superior effects which often ensue after taking the weak infusions or teas which are the favorite remedies of the poor and the nostrums of so-called herbalists. I am firmly convinced that our medicines frequently fail in their operation for lack of sufficient dilution; and, although I do not counsel their administration in an inconveniently bulky form, I do most strongly urge the taking of a copious draught of water or some harmless diluent after each dose of the remedy.

Sulphur is an agent which sometimes proves peculiarly valuable in the treatment of chronic rheumatism, especially when the skin is inactive. Amongst the poor it has long been a favorite remedy, and by its action has doubtless contributed not a little to the reputation of the powder termed the "Chelsea Pensioner,"¹ of which it forms a large proportion. Administered in half-drachm doses three or four times in the course of the day, and aided in its action by the stimulating effect of the simple vapour or

¹ See p. 415.

the sulphur vapour bath, it is often extremely efficacious in removing chronic muscular pains, and there are few remedies within the range of the Pharmacopœia on which so much reliance can be placed. Its use, however, should be restricted to muscular and neuralgic rheumatism; for, in the articular form of the disease, accompanied by synovial effusion, and in periosteal rheumatism, it is far inferior to other remedies, if, indeed, it be not altogether valueless.

Colchicum is of far less service in chronic rheumatism than in the more active form of the disease, and its administration should be restricted to those cases in which the liver is inactive and in which the joints are swollen, with effusion within the capsule, and the pain is aggravated by heat. Under such circumstances, in combination with alkalies, diuretics, and opiates, it sometimes proves exceedingly beneficial.

The valuable properties of iodide of potassium are seldom displayed when the muscular structures are the parts affected; but they are strikingly manifest when the patient is out of health and the periosteum is implicated. In such cases, administered in five or eight grain doses, it speedily gives relief, not unfrequently removing the pain and swelling in the course of a few days; and even when the disease proves more intractable, and lingers on for several weeks, the intensity of the pain is soon subdued, and the patient's health gives tokens of improvement. Indeed, so potent is the influence of this medicine over this particular form of the disease, that in many instances the cure may be safely intrusted to its unassisted powers; but in old-standing cases, where the health is much impaired, it is advisable to combine it with bark and sarsaparilla, and to exhibit a full dose of opium at night. The bowels, in such a case, should

be regulated by gentle laxatives, and the general health sustained by a full and nutritious diet.

A valuable adjunct to the iodide of potassium in many of these cases is the bark of the *Daphne Mezereon*. This remedy was introduced to the notice of the profession by Dr. Alexander Russell,¹ as an efficacious cure for venereal nodes, and in small doses is frequently administered in the compound decoction of sarsaparilla, of which it forms one of the ingredients. But however valuable its properties may be, and their value in many instances is undoubted, they cannot be exerted to any advantage in the small doses in which it is usually exhibited, and, therefore, whenever it seems desirable to give it, either alone or in conjunction with sarsaparilla, an infusion should be made of half an ounce of the root to a pint of water. This when strained may be given in doses of an ounce or an ounce and a half, in conjunction with the iodide and extract of sarsaparilla; and though it does not possess the power attributed to it by Dr. Russell, of curing secondary syphilis, it certainly proves stimulant, diaphoretic, and alterative, and, in many instances, is said to produce effects such as cannot be obtained from the iodide alone. In purely muscular rheumatism, it sometimes exerts a beneficial influence, but its good effects are most strikingly displayed in the class of cases which are benefited by Iodide of Potassium.

The late Dr. Percival was in the habit of prescribing the cod-liver oil in chronic rheumatism; and Dr. Bardsley, in his valuable medical reports, speaks favorably of its curative influence. I have sometimes administered it alone in half-ounce doses when the patient has been thoroughly out of health; and in some such cases with undoubted benefit.

¹ See 'Medical Observ. and Inquiries,' vol. iii, p. 194.

But, under ordinary circumstances, its efficacy appears to be greatly increased by its exhibition in conjunction with other remedies, and therefore whenever a case occurs in which, from the cachectic condition of the patient, its administration seems likely to be attended with benefit, I usually give it in the form of an emulsion with the *Liquor Potassæ* and *Iodide of Potassium*; or else combine it, if circumstances permit, with the syrup of the *Iodide of Iron*. When the appetite is indifferent, the circulation languid, and the pulse weak, the *Sulphate of Quina*, in combination with the mineral acids, aided, if necessary, by some preparation of *Iron*, has appeared to me a more useful addition than the *Liquor Potassæ* and *Iodide of Potassium*.

Hydrochlorate of Ammonia is a remedy of singular efficacy in chronic rheumatism, yet, strange to say, is almost unknown as such to the profession. In no treatise on rheumatism which I have had an opportunity of consulting, do I find the slightest notice of its virtues. Yet its action on the skin is admitted by those who have watched the effects of its internal administration. *Sunderlin* reports, that it acts as an "excitant" to the bowels, the skin, and the kidneys; that "it not only increases secretion, but improves nutrition and assimilation," and "promotes not only the mucous secretions, but also cutaneous exhalation."¹ Certain it is, that in fifteen or twenty grain doses, in combination with bark, it sometimes produces marvellously good results, and is frequently serviceable when other remedies have proved inefficient. The character of the secretions improve under its influence, the skin acts more freely and regularly, and the disease gradually subsides.

¹ 'Handbuch der Speciellen Hulmeltellehre.' Quoted in *Pereira's 'Materia Medica.'*

Its beneficial effects, however, are most remarkably exerted in muscular rheumatism ; and when the periosteum or the joints are affected, it seldom affords us much assistance.

Arsenic is another remedy which in obstinate cases characterised by dryness and harshness of the skin is often productive of excellent effects, improving the health, augmenting the appetite, stimulating the capillary circulation, and restoring the natural perspiratory action. Its anti-rheumatic virtues, however, are as yet but little known to the profession, and it was mere accident which first directed my attention to it. In November, 1853, a gentleman consulted me respecting rheumatic pains in the joints, which had tormented him more or less for seven years. These pains had supervened on an attack of articular rheumatism, which lasted three weeks, and was accompanied by pain, heat, and swelling of the affected parts. The inflammatory symptoms had never since returned, nor had there been more than occasional tumefaction for a few days ; but lately the pains had been unceasing, and had given rise to excessive stiffness and soreness of the whole body, especially of the joints. He had taken guaiacum, mercury, iodide of potassum, sarsaparilla, and all the ordinary remedies for rheumatism, and had tried the effect of baths and mineral waters in this country and on the Continent. Under these circumstances I was at a loss what medicine to prescribe, but finding that the pains were of a somewhat intermittent character, I tried full doses of quinine in the first instance, and subsequently, as they failed, administered arsenic. The pains soon yielded, the appetite improved, and I had the satisfaction of seeing my patient regain his health. Since that time I have prescribed it in several instances with good effect ; and although, as stated at p. 363, when speaking of its action on rheu-

matic gout, I do not feel quite satisfied as to its *modus operandi*, and am unable as yet to point out the precise conditions under which its beneficial influence is most likely to be exerted, the impression is strong in my mind that the cases which derive most benefit from its administration are those in which the skin is inactive, the bowels regular, the kidneys healthy, and the urine clear, but of low specific gravity—in cases, in fact, characterised by want of tone and nervous energy in the system. My experience, however, is at present very limited, and the grounds for an opinion therefore very imperfect, and I shall be glad to receive information on the subject from any one who will kindly favour me with it.

In some obstinate cases of chronic rheumatism, more especially when supervening in a system which has been poisoned by the syphilitic virus, it is expedient to have recourse to the exhibition of mercury. Indeed, many such cases are absolutely incurable until its agency is employed; and in such instances its administration is speedily productive of good effect. Within the last four years I have known several patients recover rapidly under the use of various anti-rheumatic remedies, in which they had fruitlessly persevered for months prior to the exhibition of a mercurial. But, in ordinary cases, mercurialization is needless, if not hurtful. It sometimes proves useful when there is excessive tenderness with puffiness about a periosteal swelling, as also when a joint is enlarged, and continues in a state of irritation uninfluenced by other remedial agents, but it is always depressing, and should not be employed unless its influence is demanded either by the urgency of the local symptoms or by the failure which has attended the administration of other remedies. If the local symptoms are severe, it may be necessary to push it gradually to saliva-

tion, but in other instances it is desirable to obtain its specific influence without the depression occasioned by ptyalism. For this purpose the bichloride of mercury, or the biniodide,¹ formed by adding the iodide of potassium to the Liq. Hydrarg. Bichloridi, prove very efficient agents, and pains which have long resisted every other remedy will often yield rapidly to their influence. Indeed, the biniodide kept in solution by an excess of iodide of potassium, and given in combination with bark, has proved in my hands the most valuable of all medicines in rheumatism which has supervened in a system tainted by the syphilitic poison, and in several instances has effected a speedy cure after the bichloride had been given in vain. Occasionally it produces slight griping and diarrhœa, but these symptoms are easily controlled, and cease directly the medicine is discontinued, or is exhibited in smaller doses. The possibility of their occurrence, therefore, forms no bar to its administration in appropriate cases, and its curative action is so strongly marked, and so speedily produced, that I never hesitate to recommend its exhibition whenever its agency is required.

Opiates seem especially called for in chronic rheumatism, by the obstinacy and wearing nature of the pain, and certainly, in some instances, their influence for good appears to extend not only to temporary abatement of suffering, but to the subjugation of that action on which the pain and suffering depend. In my experience, however, this rarely

¹ The following are formulæ I often employ :

℞ Liq. Hydrar. Bichloridi, ʒj-ʒij ;	Or, Liq. Hydrar. Bichloridi, ʒi-ʒij ;
Potassii Iodidi, gr. v-x ;	Potassii Iodidi, gr. v-x ;
Extracti Sarzæ, ʒss-ʒj ;	Syrupi Sarzæ, ʒij-ʒiij ;
Decocti Cinchonæ, ʒiss.	Tincturæ Cinchonæ Co., ʒi-ʒij ;
M. ft. Haustus.	Decocti Cinchonæ, ad. ʒiss.
	M. ft. Haustus.

has been the case. Generally they have done little more than assuage present pain, and, by obtaining for the patient a respite from suffering, afford him that rest which is as essential to the recovery of his health as to his hourly personal comfort. This, then, is the view with which they should be administered, and their exhibition therefore should be limited to cases in which Morpheus is a stranger, and must be wooed before he will lend his assistance. Battley's sedative solution and the *Morphiæ Acetas* are admirable and efficient preparations, but in no form do opiates prove more serviceable in this complaint, than in that of the celebrated Dover's powder, the *Pulvis Ipecacuanhæ Compositus* of the *Pharmacopœia*.

Sometimes, however, opiates disagree with the stomach, or fail in giving relief. In either case, recourse may be had to other sedatives, which, under certain circumstances, prove more efficacious than the preparations of opium. This is so especially when the pain assumes a neuralgic character. Cases, for instance, which have long resisted opium and the various preparations of morphia, have yielded as if by magic under the influence of a full dose of belladonna. The same may be said of stramonium, conium, and hyoscyamus. But in no instance have I seen more speedy or more complete relief from suffering than has sometimes followed the exhibition of the ethereal tincture of the *Cannabis Indica*. In one patient, a medical friend, whom I was not asked to see until after all ordinary sedatives had been tried, a single dose of the tincture gave immediate relief, and was followed by a long refreshing sleep, to which he had been a stranger above two months. A similar effect, though less strongly marked, has resulted from its use in many other instances. But great caution must be observed in the employment of this remedy. If it fails in producing a narcotic effect, it is apt, even in doses

of twelve or fifteen minims, to produce considerable excitement, and its use, therefore, should be restricted to cases accompanied by nervous exhaustion. Indeed, its assistance appears to me called for in the very cases in which opium, belladonna, and other pure narcotics, not unfrequently prove useless ; whilst in cases characterised by nervous excitement, and accompanied by a hot skin or a hurried pulse, its action proves hurtful rather than beneficial.

There is yet another sedative which deserves especial notice as being remarkably serviceable in many forms of chronic rheumatism. I allude to aconite, a remedy which was introduced by Stoerk, of Vienna, in 1762, and was largely used in this country by the late eminent Dr. Pitcairn, of St. Bartholomew's Hospital. Within the last seven years I have prescribed the tincture in a large number of cases ; and in many which were unattended by redness and swelling, its remedial effects have been strongly marked. If, in some instances, it has not exercised any control over the violence or duration of the pain, it has acted almost magically in others, and relief has followed as speedily after its exhibition, as it does not unfrequently after its external application. Sometimes it produces a sensation of heat and tingling in the extremities, constriction across the throat, and a constant desire to swallow ; but unless such symptoms are persistent, and accompanied by vertigo, faintness, palpitation, or some other disagreeable sensation, it is not necessary on that account to discontinue its exhibition. When the secretions are out of order, and the general health is impaired, it rarely proves efficacious until other medicines have been administered ; but in many cases of chronic rheumatism, unconnected with a venereal taint, when the symptoms are those of aching pain and stiffness, without any redness or swelling of the parts, or any notable derangement of the secretions, it is valuable beyond all other reme-

dies we possess. Observation, however, has led me to believe that it is useless to persevere in its administration, if some relief be not speedily obtained; whereas, if it prove sedative in its action, its use should be persisted in, and the dose cautiously increased. Dr. Mantell, of Bath, who has used it extensively during the last twenty-five years, and has kindly favoured me with the result of his experience, reports most favorably of its curative influence.

Aconite is said to be diuretic and diaphoretic in its action; but although undoubtedly it often excites perspiration, it has so rarely displayed any diuretic qualities in the cases which have fallen under my observation, that I suspect the occurrence of diuretic symptoms has been a mere coincidence. Five or six minims of the Pharmacopœia tincture may be given in the first instance, twice or three times a day, and may be gradually, but cautiously, increased to ten or even twelve minims. But considerable difference exists in this respect, according to the degree of care which has been exercised in preparing the tincture, and to the combination in which it is administered. For although the dose of the tincture ordinarily met with in the shops may be increased, in some instances, to ten or even twelve minims, such is rarely, I may almost say never, the case in regard to a carefully prepared tincture. So, again, if the tincture be given in combination with alkalies, the aconitine is precipitated, and unless great acidity exist in the stomach, the remedy is rendered almost inert; whereas, given in conjunction with a few drops of dilute sulphuric acid, its solubility is ensured and its full power is exerted. Hence it must not be inferred, because ten or twelve minims are readily borne when taken in an alkaline mixture, that the same dose may be administered with impunity if the alkalies are omitted, and the mixture is made either acid or neutral. I have known one instance in which disagreeable effects were thus

produced, and can well conceive it possible for dangerous symptoms to supervene. Therefore, in a matter of so much importance, I deem it advisable in every instance to administer aconite in an acid mixture, in order that the full strength of the dose may be felt at once. Further, I always think it right to insist that wherever the mixture is dispensed in the first instance it shall be made up for the future, so as to ensure an uniformity in the strength of the tincture, and consequently in the dose of the medicine.

In that form of disease which is known as lumbago, brisk purgatives are some of our most efficient allies, and usually should be made use of at the commencement of the attack in conjunction with alkalies and diuretics. Their efficacy, however, varies according to the amount and character of the alvine and urinary secretions. When the urine is scanty, high-coloured, or loaded, the bowels costive or the dejections dark-coloured and offensive, they are almost always of inestimable service, and a large turpentine and castor oil enema, or a few doses of Colocynth and Calomel, administered at bedtime, followed each morning or on alternate days by a black draught, containing half an ounce of the Potassio-Tartrate of Soda, and thirty minims of Colchicum wine, have often gone far towards effecting a cure. But when the urine is abundant and light-coloured, the bowels regular, and the dejections natural, the value of purgatives is not so apparent. Indeed, so little benefit has usually resulted from their employment in such cases that I now very rarely have recourse to their administration. In the former instances, the pain is probably connected more or less intimately with irritation of the lumbar and sacral nerves, and this is relieved, not only by the full evacuation of the bowels which follows the use of purgatives, but by the change induced in the character of the secretions. In

the latter, the lumbar muscles and their fasciæ and tendons are the parts principally affected, and hence the remedies adopted for their relief should have relation to their superficial position, and to the more purely neuralgic character of the pain. Though internal remedies should not be neglected, our main reliance must be on local applications. If the urine be turbid, and the case be attended by symptoms of local congestion, cupping on the loins is of essential service, and dry cupping may be often employed beneficially when it is not thought desirable to abstract blood. Baths are also valuable agents, particularly the warm-bath, rendered alkaline by the addition of Carbonate of Soda or Potash; as are also fomentations, formed by placing across the loins flannel wetted with an alkaline and opiate solution, and covered with a piece of flannel. When, on the other hand, there are no symptoms of local congestion, and the case appears to be of a neuralgic character, electricity and galvanism may be tried with a fair prospect of affording relief. In such cases the continuous current should be employed, and it cannot be applied more satisfactorily than by means of one of Pulvermacher's chain batteries. Stimulating embrocations, followed by sedative fomentations kept constantly applied to the loins,¹ are also very useful in

¹ Subjoined are two very useful forms of applications in these cases :

R Olei Cajeputi, vel Olei Origani, vel Olei Succini, ʒv ;
 Olei Terebinthinæ, ʒv ;
 Linimenti Ammonia, vel tincturæ Aconiti, ʒvj.

M. ft. Linimentum.

R Liquoris Opii Sedativi, ʒi ;
 Extracti Belladonnæ, ʒi ;
 Glycerini, ʒiss ;
 Tincturæ Iodinii Co., ʒiv ;

M. ft. Lotio pro lumborum fotu adhibendar.

To the former may be added ʒiv of the Tincture of the Arnica

obstinate cases, as are also mustard poultices, and plaisters of a stimulating or of a soothing character. In some instances, after the more active symptoms have subsided, friction with the naked hand, with a French flannel brush, or with a horse-hair glove, followed by a simple flannel bandage covered with oiled silk to prevent evaporation, or a band of Markwick's epithem worn across the loins, is sufficient to afford permanent relief.

A useful external application in Lumbago, as well as in Stiff-neck and other forms of muscular rheumatism, is that which has been termed Sir Anthony Carlisle's blister, an agent comparatively unknown to the Profession. It consists in the application to the skin over the affected part, of a small flat iron, gently heated in a spirit-lamp or boiling water. The operation is completed in a few seconds, is productive of little or no pain, and is immediate in its effects. Amongst the poorer classes of the community the practice of ironing the painful part with a laundress's iron, the skin being covered with a piece of thin flannel or brown paper, had long been in vogue in various forms of muscular rheumatism, but it was not till the year 1826, when Sir Anthony Carlisle addressed a letter to Sir Gilbert Blane describing the benefits derivable from the application of a hot iron to the naked skin, and recommending a peculiar form of instrument for the purpose, that the attention of the Profession was directed to the subject. Of late years, Dr. Corrigan, of Dublin, and Dr. Day, of St. Andrews, have borne additional testimony to the value of this remedy, and have published a series of cases successfully treated

Montana, which is oftentimes of the greatest service; but if its assistance is had recourse to, it will be necessary to watch closely the effect produced on the skin, inasmuch as a very troublesome eruption is apt to result when its use is long persevered in.

by its means; and to these gentlemen the profession is indebted for the revival of an obsolete, though useful practice.

The instrument recommended by Dr. Day¹ "is a metal button, about half an inch in diameter and a quarter of an inch in thickness, connected by an iron shank with a small wooden handle. The whole instrument," he says, "resembles a very small hammer. On heating the button, which is effected in about a quarter of a minute by the flame of a spirit-lamp, I place the end of the forefinger on the curve. When the heat becomes uncomfortable to the finger, the instrument is ready for use. Dr. Corrigan's mode of applying it is to touch the surface of the part affected, at intervals of half an inch, as lightly and rapidly as possible. I have usually found more service from very lightly drawing the flat surface of the heated button over the affected part, so as to act on a greater extent of surface. The cuticle is never raised, and the only visible effect is a slight degree of local redness, either in lines, according to my plan, or in circular patches, if Dr. Corrigan's directions are followed." Dr. Day concludes by expressing his opinion "that the practitioner who will give the thermic treatment a fair trial will not readily abandon a remedial agent by which human suffering can be so easily and rapidly alleviated." In advocating the use of his favorite remedy, Dr. Day asserts² that he "never met with a case of lumbago which did not completely yield to three or four of these trivial operations." But judging from my own very limited experience in the use of this application, I should say that it often fails in affording relief, and proves useful in exact proportion as the pain is truly neuralgic. In lumbago, accompanied by

¹ Day, 'On Diseases of Advanced Life.' Appendix. ² Loc. cit.

scanty, loaded urine, a coated tongue, costive bowels, and other symptoms of constitutional derangement, I have never found it of the slightest service until after these symptoms have been subdued, and the same holds good in other forms of muscular rheumatism. But when the pain has appeared referable to the continued local effect of a formerly existing cause of irritation, or when from the first it has been of a purely local and neuralgic character, and unaccompanied by constitutional disturbance, then the hot iron has well sustained its character, and in some instances has afforded instantaneous relief. Indeed, I know of no remedy to which we can have recourse in such cases with a better prospect of relief; but I question whether the instrument recommended by Dr. Day is as efficacious as a laundress's small box-iron, or one of the irons used by chemists for spreading plaister, with either of which the limb may be ironed whilst the skin is covered with a piece of brown paper or thin flannel. Certain it is that in one case in which Dr. Day's little button had proved utterly useless, a common laundress's iron gave instant relief, a result which I attributed to the much larger surface subjected to heat in the latter instance.

In striking contrast with this thermic mode of treatment is the frigorific plan suggested by Dr. James Arnott. He recommends that a freezing mixture should be applied to the back for the space of four or five minutes, or until complete anæsthesia of the parts is produced, and he states that in three only out of nine cases in which he employed this remedy, was it found necessary to apply it a second time.¹ The mode of using this remedy is more particularly described in my chapter on Sciatica, and it is only neces-

¹ 'On Neuralgic, Rheumatic, and other painful Affections,' p. 29.

sary here to state that the application, though somewhat painful, and occasioning a degree of redness or congestion which continues for a few hours or even days afterwards, according to the duration of the freezing and other circumstances, is not productive of dangerous results, and may therefore be tried when other and milder remedies have failed. But it is often looked upon with dread by the patients, and sometimes occasions excessive and enduring tenderness of the parts; and therefore I would not counsel its employment until the catalogue of other remedies has been exhausted.

Unfortunately, I have had so few opportunities of noting its effects, that my testimony as to its action is not of much value. In two instances accompanied by loaded urine and constipation, it utterly failed in influencing the pain; in another, which was unaccompanied by feverish symptoms, immediate relief resulted from its application; and in two others of a similar nature, relief was experienced, but a cure was not effected by the first application, and the patients refused to submit to a second trial of its virtues.

From such limited observations no legitimate inference is fairly deducible, but I can readily conceive that where lumbago is connected with a purely neuralgic condition of the superficial fasciæ or the muscular structures, or even with congestion of such parts unaccompanied by derangement of the secretions, the powerful influence of a very low temperature may deaden the sensibility of the nerves, lull the pain, and even put an end to the local congestion. But I cannot understand how any such agency can relieve the disease when arising, as it often does, in connection with disordered secretions, loaded bowels, or constitutional derangement; and although I am unwilling to rest my argument upon the two unsuccessful cases of this sort above

referred to, I think it fair to adduce them in support of what appears to be a sound physiological view. Experience, however, is better than theory, however specious, and I shall be glad if further observation, or the well-attested experience of others, enables me hereafter to modify my opinion.

Of internal remedies, none prove more useful when the bowels are regular, and the urine is clear and abundant, than Oil of Turpentine, and few are found less serviceable when the bowels are costive and the urine is high-coloured and loaded. Administered in half-drachm or two-scruple doses, either in a draught, or in the form described below,¹ it is an agent on which the greatest confidence may be placed, and case after case has been admitted under my care at St. George's Hospital, in which it has effected a rapid cure, after Guaiacum and other remedies had been tried in vain. The only serious objection to its use is the possibility of its giving rise to strangury and nephritic irritation, but if care be taken in watching its effects, no apprehension need be entertained on this score. The mere possibility, however, of its causing such symptoms would, of course, deter a cautious practitioner from recommending it to a patient to whom he was unable to pay frequent visits.

Stiff-neck is benefited by the same sort of local remedies as Lumbago. Though in some few instances leeches may be needed, yet more generally, friction, with opiate and stimulating embrocations, followed by warm fomentations, to the part, proves quite efficient. When the disease is of

¹ Spiritûs Terebinthinæ;
Mucilaginis Acaciæ;
Mellis, ãa partes æquales.

M. ft. Electuarium cujus sumatur cochlearium unum Theæ ter die.

recent occurrence, a few drops of Chloroform or Chloric Æther may be held to the part in the palm of the hand, until redness of the skin is produced. In several instances in which the chloroform has been so employed, the relief afforded has been immediate, and, after two or three applications, has remained permanent; but when the complaint is of long standing, friction is of greater service.

The beneficial influence of baths is nowhere, perhaps, displayed more strikingly than in chronic rheumatism. The warm-bath, either alone or rendered alkaline by potash or soda, the hot-air bath, and the vapour-bath, have each their respective merits. The latter two have always appeared to me the most efficient agents for forcing perspiration, and relieving the symptoms in those cases in which the pain is aggravated by warmth; whereas the warm-bath, at a temperature of at least 100°, has been equally if not more beneficial to those in whom warmth proves grateful and sedative. It must be remembered, however, that the vapour and hot-air baths have the great advantage of being applicable while the patient is lying in bed, and this, in some instances, may be a sufficient recommendation to determine their employment in preference to the water-baths.

In those to whom cold does not prove chilling, and in whom proper reaction ensues after the shock, the shower-bath, more especially of salt water, is frequently of essential service, and its good effects are increased when reaction is maintained by friction. Local baths, as by a douche of water, are also powerful assistants, the more so as they can be employed repeatedly, and can be directed to the immediate seat of pain. Should all these fail, the mysterious agency of the Bath, Harrogate, or Buxton waters, of the Woodhall Iodine and Bromine Spa, or of the Droitwich

saline bath, may be resorted to, or the patient may be sent to some of those continental thermal springs whose virtues were discussed in a previous Chapter.¹

Blisters have been recommended, and are frequently employed for the relief of chronic rheumatic pains, and, as with other remedies, their repute has varied according as they have been made use of properly or improperly. In muscular rheumatism they are seldom of much service, and are rarely if ever necessary; and, in articular rheumatism, are never needed, unless the pain has been long fixed in one particular joint, and some thickening or enlargement has gradually taken place. But in periosteal rheumatism they are extremely serviceable, more especially when there is thickening; and in rheumatic enlargement of the bursæ which has passed into a chronic form, they are almost indispensable for effecting a rapid cure. In both these latter cases their application should be followed by the external use of iodine. The iodine paint, which is often recommended, is not a good form of application, except for the purpose of counter-irritation, inasmuch as it causes disquamation of the cuticle, and thus by its caustic action interferes with the absorption of the remedy. A much more serviceable ally is to be found in the Compound Iodine or Biniodide of Mercury ointment, or the Iodine lotion, the formula for which I have given elsewhere.²

I have hitherto spoken of liniments and fomentations as applicable only to lumbago and other varieties of muscular rheumatism. But their efficacy is by no means confined to these cases. Nothing proves more serviceable in old-standing, painful affections of the joints, than warm opiate

¹ See Tables, pages 396-400, of this Treatise.

² Note, p. 370.

fomentations; and not unfrequently liniments or embrocations prove equally beneficial. Various prescriptions have been already given, which, in my hands, have proved exceedingly efficacious;¹ but in this particular form of disease, a liniment, composed of a drachm of the essential oil of bitter almonds and fifteen drachms of almond oil, may be used with the greatest benefit. The native oil of laurel, applied externally, was a remedy much in vogue amongst the North American Indians for the cure of rheumatism and other affections of the joints, and the liniment now recommended possesses all its virtues in a much higher degree. More than once, pains, which had resisted all other remedies, have yielded readily under its soothing influence.

There is yet another external application well deserving of a trial in muscular rheumatism, which has passed into a chronic state: I mean an ointment containing Aconitine or Veratria. That containing aconitine is far the most powerful and efficient. So long as the disease is at all active in its nature, I have never known benefit derived from its employment; but its beneficial influence has been so often witnessed when the more urgent symptoms have been subdued, and the remaining pain has appeared to be neuralgic in its nature, that no one can doubt its efficacy in many cases which, under other treatment, prove obstinately intractable. It is highly stimulant and counter-irritant in its action, and excites redness of the skin wherever it is applied, together with a sense of tingling or pricking. But as soon as this has ceased, its effect is sedative; and, in some instances, the only interval of ease which the patient obtains are the few hours which imme-

¹ Page 428 of this Treatise.

diately follow its employment. Sometimes, from the situation of the pain, it may be difficult, if not impossible, to make effective use of the ointment, and, in such cases, Fleming's Tincture of Aconite or an alcoholic solution, formed by dissolving from three to four grains of aconitine¹ in six drachms of rectified spirit and two drachms of Glycerine, and applied to the part by means of a camel's hair brush, proves an excellent and efficient substitute. In intercostal rheumatism aconitine proves remarkably serviceable, and is undoubtedly the most valuable external remedy we possess.

When the fleshy parts are principally affected, and the patient is unable, from the nature of his pursuits, to confine himself any longer to the house, it is well to protect the seat of pain from cold, and to maintain a constant action of the skin, by the application of flannel bandages or warm stimulating plaisters. In lumbago nothing answers better than a bandage of oiled silk lined with flannel, the *Emplastrum Arnicæ Montanæ*,² and the Burgundy pitch plaster; and if it be considered desirable to increase the stimulating properties of the latter, its surface may be sprinkled with hydrochlorate of ammonia. When the joints, the tendons, the bursæ, or the periosteum are affected, the *Emplastrum Ammoniaci c. Hydrargyro*, is generally of greater service, whilst in some instances in which the joints and tendons are stiff and thickened, the *Emplastrum Iodini*³, spread upon wash-leather, and applied closely round the affected part, exerts a stimulating and sof-

¹ The aconitine should be obtained from Morson, of Southampton Row, Bloomsbury.

² This plaister is prepared by Twinberrow, of Edward Street, Portman Square.

³ To be obtained at Ewens's, 106, Jermyn Street, St. James's.

tening influence which is not to be attained in any other way. Again, when the irritability of the skin is such as to preclude the use of these stimulating plaisters, the Emplastrum Opii may be ordered, or warmth may be preserved by wrapping the part in the finely-carded wool which is known by the title of medicated wool. The rheumatic patient is so apt to suffer from cold and atmospheric vicissitudes, that he should be warmly clad at all times, and not only should the parts most apt to suffer be more than ordinarily protected, but his whole body should be encased in flannel, or better still in silk, and, in winter, covered with that warm woollen clothing known under the name of fleecy hosiery.

Other expedients have been adopted occasionally for the relief of old rheumatic pains, among which I may mention electricity, galvanism, and acupuncture. In my experience, however, they have been rarely needed, and when needed, have seldom afforded material aid. The former I have seen extensively employed, and have sometimes used it at the instance of my patients; but so frequent has been its failure, that in the few cases in which relief has followed its use, I have been induced to regard the pain as of nervous origin, or its subsidence coincidently with the use of electricity as a mere coincidence. Galvanism, also, I have generally found useless, if, indeed, it has not aggravated the pain; but in some few instances of lumbago, and in certain other instances, in which the pain has been stationary, and more or less paroxysmal in its character, I have witnessed such speedy recovery after the employment of the continuous current, that I do not hesitate to recommend its use in obstinate cases of muscular and neuralgic rheumatism. In the synovial form of the disease, I have never known it of the least service.

Observation has not supplied me with sufficient data for an

opinion as to the efficacy of acupuncture. On looking over my note-books, I find only five cases in which I have witnessed its application in muscular rheumatism. In four of these it proved utterly useless; in the fifth some amendment shortly followed its use, but whether as the result of its employment, is questionable. Mr. Churchill, however, has reported most favorably on its curative powers;¹ and Dr. Elliotson, who "has employed it very extensively, both in private and in St. Thomas's Hospital, in rheumatism," entirely confirms Mr. Churchill's opinion, and says, "it is useful chiefly in rheumatism of fleshy parts, and the more so as the disease is less inflammatory."² In France, M. Berlioz³ has tested it largely, and speaks most highly of its virtues; as does also M. Jules Cloquet, who has recorded the history of 91 cases in which it proved of the greatest service. I am bound, therefore, to admit, that in some cases it may prove eminently useful; but I am satisfied by experience that its application is disagreeable, that its curative powers are uncertain, and the cases in which it is necessary to call them into requisition so rarely met with as to be quite exceptional.

When all remedies fail, change of air, if not of climate, with active exercise, judicious bathing, long-continued friction, and constant attention to the state of the skin, will often prove effectual for our patient's relief. So long as the effect of a warm climate is untried, we need never despair of a radical cure. Even when our best-directed efforts have proved fruitless a few days' sea-sickness, followed by the influence of genial warmth, a change of scene, repose

¹ 'A Treatise on Acupuncture,' &c. London, 1828.

² 'Medico-Chir. Trans.,' vol. xiii.

³ 'Mémoires sur les Maladies Chroniques, les évacuations sanguines et l'acupuncture.' Paris, 1816.

of mind, an altered diet, and a new mode of life, not unfrequently prove successful in restoring a healthy state of assimilation, and in stimulating the skin, the kidneys, and other excretory organs, to the vigorous exercise of their functions. With the stomach performing its duty properly, the skin acting freely and regularly, and the liver and kidneys fulfilling their office of depurating agents efficiently, the rheumatic poison cannot fail to be eliminated, its further formation checked, and the system invigorated. And when such is the case, the rheumatic pains will not be long before they take their final departure. Many a person who for years had suffered from chronic rheumatism, has speedily got rid of this inveterate enemy, by thus having recourse to Nature's assistance in conjunction with the aid of judicious medical treatment.¹

¹ Whilst these sheets were passing through the press, I met with the following observations of my friend, Dr. Dundas, in his recently published work, entitled 'Sketches of Brazil,' which I quote in confirmation of the powerful and salutary effect very often produced on the organic functions by a brief residence in a warm climate. Speaking of the salutary influence of the sun, he says (p. 103), "Independently of direct physiological proof, this proposition will be fully admitted by every tropical sojourner, in whom years of subsequent exhaustion can never entirely efface the recollection of the buoyancy of spirits, unclouded mind, and exquisite appreciation of mere animal existence, which, unless counteracted by some special influence, characterise the first years of a tropical life."

CHAPTER XIII.

ON SCIATICA, AND OTHER FORMS OF NEURALGIC RHEUMATISM.

WHEN rheumatism attacks the nerves or their fibrous envelopes, it causes pain which follows the course of the nervous trunks, and extends along their several branches. The pain is bounded by such narrow limits, and can be traced so clearly following the track of the larger nerves, that it cannot be mistaken for pain affecting any of the other structures. It is often somewhat paroxysmal in its accession, and, though varying in its character in different cases, is usually severe and very obstinate in its continuance. Sometimes it is fugitive, and wanders from one extremity to another, but more generally it remains stationary in the part first affected for days, or weeks, or months. It is frequently accompanied by constitutional derangement, and is sometimes attended by fever, but more commonly, although the patient is "out of sorts," the pulse, the tongue, and the urine, do not deviate greatly from the condition of health.

The most remarkable, as also the most common, form of its attack, is that known by the name Sciatica. Emerging from the pelvis beneath the lower border of the pyriformis muscle, the sciatic nerve, formed by branches from the sacral plexus, passes vertically down the back of the thigh to the ham, and thence, under the name of posterior tibial, descends to supply the leg and foot. This is the nerve

which, when irritated by disease, excites the distressing pain of sciatica. The pain, like the nerve, commences in the loins and shoots down the back of the thigh and leg. It is usually aggravated by damp and cold, as also by pressure, and by movement of the limb, and thus it occurs with more than ordinary severity when the patient goes up stairs or attempts to walk after sitting in a cramped position. In one case it is of a dull, aching, or benumbing character, and wearies by its long continuance rather than by its severity; in another it exhausts, not only by its obstinacy, but by the extreme violence of the startings, accompanied by pains of an excruciating nature, which occur at intervals throughout the attack; whilst, in a third class of cases, it prostrates all the energies of mind and body by the continued indescribable torture which it occasions. The limb actually quivers with pain, and the muscles are drawn into knots by cramp, and thus afflicted and unable to move, the unhappy patient lies moaning during the day, and dreading the approach of night when the violence of the symptoms is, if possible, increased.

Sciatica is commonly met with about the middle period of life, very few cases occurring before the age of 20, and as few after the age of 60. This will be seen from the subjoined tables,¹ and although there is no reason why the

¹ <i>Collection of Cases cited by M. Valleix.</i>				<i>Author's Cases.</i>	
Up to 20 years of age	.	.	4	.	1
From 20 to 30	.	.	22	.	10
„ 30 to 40	.	.	30	.	18
„ 40 to 50	.	.	35	.	31
„ 50 to 60	.	.	26	.	13
„ 60 to 70	.	.	6	.	2
Over 70	.	.	1	.	0
				<hr/>	
				124	75

disease should not occur at a much earlier, or a much more advanced age, I have never chanced to encounter it before the age of 15 nor after the age of 67. Usually confined to one side of the body, it sometimes affects both extremities at the same time, so that in 14 out of 103 examples of the disease, reported by Mons. Valleix, the pain extended to both extremities, whilst in 46 it was confined to the left side and in 43 to the right.¹ In my own experience the simultaneous affection of both extremities has been much more uncommon, for I have met with it only in five instances, whilst in 42 cases, the pains attacked the right side only, and in 28 invaded the left.² In some other respects my observations differ from those of eminent members of our profession, for no less than 61 out of my 75 cases occurred in men, and 14 only in women, whereas Dr. Copland³ gives it as his opinion that women are more prone to its attacks than men. In this instance, however, Mons. Valleix's experience coincides with mine, for he found as many as 72 men⁴ among 124 patients affected with this disorder. It is probable that my numbers may show a greater disproportion between the frequency of attacks in the two sexes than is warranted by general experience, inasmuch as my cases, with thirteen exceptions, occurred among hospital patients, in whose rank of life the men, from the

¹ See Valleix, '*Traité des Névralgies*,' p. 503.

² These 75 cases were well-marked examples of the disease, and do not include any other of the painful affections of the hip, or muscles of the thigh, which are often, but wrongly, comprised under the term *sciatica*. This may possibly account for the discrepancy observed between my figures and the recorded experience of certain other observers.

³ See '*Dictionary of Medicine*.'

⁴ *Loc. cit.*, p. 566.

nature of their occupation, are, much more than the women, exposed to the exciting causes of the disease. Judging however, from inquiries I have made from various gentlemen in extensive practice, I am inclined to think that, if hysterical affections and painful rheumatism of the muscles of the thigh are excluded from the calculation, the proportion of attacks in the two sexes will be found to approach nearer to my numbers than even to those of Mons. Valleix.

The disease, as already stated, is apt to prove very obstinate in its continuance. Sometimes it may be subdued by appropriate treatment in the course of a few days, if proper remedies be given early and pushed vigorously ; but if not removed soon after its invasion, it frequently resists all efforts for its expulsion, and harasses the patient for weeks or months. Indeed, the limb may never altogether recover from the attack, but may waste, and remain for years, if not for life, atrophied, and more or less weak and paralysed. Three well-marked instances of this sad result have come under my notice in hospital practice. In one of these cases the attack of sciatica had occurred thirteen years, in another, eleven years, and in the other five years before I saw the patient. In truth, sciatica is not itself a disease, but rather is a *symptom* of many diseases. Thus, in some instances, it depends upon organic changes in the nerve itself, or the surrounding structures ; in others, upon mischief in the brain ; in others again, upon nephritic or gastric irritation, or upon irritation of the sacral plexus consequent on an unhealthy loading of the intestines ; whilst in another large class of cases it is connected with constitutional causes, each one of which produces a different alteration in the condition of the blood, and requires for its removal a different mode of

treatment. And as different affections have been thus confounded under the one title of sciatica, the cure in each case is dependent on the accuracy of the physician's diagnosis. A remedy which is suited for the relief of a simple painful affection of the nerve, may be useless to a patient who is suffering from rheumatic or gouty irritation, or from inflammation with effusion of lymph and serum into the sheath of the nerve; whilst that, again, which in such a case proves beneficial, would probably exert no curative influence when the pain is dependent upon nephritic, gastric, or intestinal irritation, or upon local changes of structure, either in the nerve itself or in the neighbouring parts.

Thus, then, in every case of sciatica, three points should be accurately ascertained before a plan of treatment is decided on: 1st, the actual nature of the disease, whether it really is what it appears to be, viz., a true affection of the sciatic nerve: 2dly, the origin and cause of the disease in the particular instance before us: 3dly, the extent and character of the mischief to be remedied.

The complaints which are most apt to be mistaken for sciatica, dependent on rheumatic or gouty affection of the nerve, are disease of the hip-joint and nephritic irritation. Neither of these, however, is likely to prove a source of much perplexity, if care be taken in the examination of the symptoms. When the former is present, there certainly may be pain in the affected side, but, unlike the pain of sciatica, it will be increased when the weight of the body is thrown on to the affected limb, as also when the head of the bone is pushed upwards against its socket, whilst the patient is lying on an even surface in a horizontal position. Moreover, after a time the disease is often accompanied by fluctuation more or less perceptible, giving rise to a fulness

in the groin, whilst the constitutional disturbance, by which it is attended increases gradually with the progress of the disease. By these symptoms alone the distinction between the two forms of malady is made sufficiently apparent, but it is rendered still more striking by the fact that, in hip disease, the pain is usually confined to the hip and knee joints, and does not extend to the trunk of the sciatic nerve, and even when it does so, is not aggravated, as in true sciatica, by pressure in the course of that nerve.

Nephritic irritation displays symptoms equally peculiar and diagnostic. If it sometimes causes spasmodic pain shooting down the thigh on the affected side, just as in a case of sciatica, it at least gives perfectly significant tokens of its true source and nature. It is accompanied by pain in the course of the ureters, and by painful retraction of the testicles, with pain shooting down to the tip of the penis, and a frequent desire to pass water. Moreover, the urine is not the clear bright urine of ordinary sciatica, but is loaded with lithates, or charged with crystals of lithic acid, or oxalate of lime. Thus it causes many symptoms which sciatica does not, and, equally with hip-disease, fails to occasion tenderness on pressure in the course of the sciatic nerve.

Having clearly ascertained that the disease is indeed sciatica, we must next investigate its source and nature. Is it a true rheumatic affection? Is it connected with a syphilitic taint? Has gout any share in its production? Is it caused by gastric or intestinal irritation? Does it appear to be of purely neuralgic origin? Is it symptomatic of mischief in the brain? or is it dependent on the pressure of some tumour, or on an alteration in the nerve itself, whether at its origin or in some part of its course? These

are indeed important questions, as involving the rationale of the treatment to be adopted, and the nature of our prognosis.

The two last-mentioned causes of the disease may be passed over for the present, as of comparatively rare occurrence, and as being accompanied by other symptoms, which, to the careful observer, can hardly fail to afford some insight into the source and nature of the existing mischief. The others, however, bear so close a relation to the treatment to be pursued in each particular instance, that it may be well to examine more in detail the symptoms by which the operation of each is denoted.

Thus, then, if the patient is thin, pale, sallow, and extremely sensitive to atmospheric vicissitudes; if he has experienced pain, or threatenings of pain, in other parts of the body; if, at some former period, he has suffered from rheumatism affecting the joints; and, above all, if his present attack is the result of exposure to cold and damp, the disease under which he is labouring is rheumatic, and is to be relieved by vapour-baths, guaiacum, alkalies, and similar remedies. On the other hand, is he stout, florid, and a free liver, taking little exercise, and sleeping much, is he plagued with heartburn, acid eructations, and occasional lowness of spirits, or has he previously suffered from gout, his malady is certainly of gouty origin, and is to be cured by colchicum, alkalies, and alteratives. Again, is he cachectic, and out of health; has his throat been ulcerated, or his skin disfigured by blotches or eruptions; has he taken mercury, or experienced pains in his bones, the mischief is probably due to a syphilitic taint, and is to be cured by sarsaparilla with iodide of potassium. Or, again, is he robust, and usually in the enjoyment of excellent health; has his present attack been preceded by constipa-

tion or irregularity of the bowels, by flatulent distension, and crampy pain in the abdomen; and, above all, is it accompanied by coating of the tongue and fetor of the breath, then, if the disease does not acknowledge either of the origins before alluded to, it is probably due to irritation of the sacral plexus of nerves consequent on an unhealthy loading of the intestines. This opinion will be confirmed, if the pain be confined to the right leg, for the disease not unfrequently arises from unhealthy accumulation of fæcal matter in the caput coli. Such a case as this is to be cured by the administration of active purgatives, both in the form of enema and by the mouth, together with such other medicines as are calculated to carry off the irritating matter, and to produce a more healthy secretion from the bowels. On several occasions I have known patients cured by the administration, on three successive nights, of two grains of calomel, two of extract of aloes, and six of scammony, followed on the morning of the fourth day by an enema, containing an ounce of castor oil, and an ounce of spirits of turpentine, or two drachms of assafoetida, or an equal quantity of the confection of rue. In many of these cases, the action of Croton oil, as recommended by Mr. Hancock, is often of the greatest service. Again, if the patient has never experienced an attack of gout or of rheumatism, and has not suffered from wandering pain in the limbs; if he is free from venereal taint, and has not been subjected to a course of mercury; if his bowels have been acting regularly, and the dejections are of a healthy character; if his skin is healthy, his tongue clean, his urine clear, the pulse normal, and the appetite and digestion good; if, in short, there is an absence of those symptoms which indicate either of the forms of derangement hitherto alluded to, his malady is probably of neuralgic origin, and

is to be relieved by tonics, sedatives, and other remedies directed against that variety of derangement. On this point our diagnosis will be greatly strengthened if the urine, when examined under the microscope, is found to be loaded with the octohedral crystals of oxalate of lime.

Thus, then, according as one or other of these causes may appear to have caused our patient's sufferings, the nature and activity of the treatment must be varied. But that is not all. In true sciatica, from whatever cause arising, very different local changes may be induced, and very different remedies required for their relief. Be the affection rheumatic or gouty in its nature, or be it due to syphilis, or to a distended colon, the pain in either case is referable to a cause of irritation, which may either give rise to no perceptible local change, or may be accompanied by lesions of a more or less serious nature—from simple congestion on the one hand, to copious effusion of serum, or of serum mixed with lymph, within the sheath of the nerve, or to thickening of the sheath itself, on the other.¹ In the former case, the means already mentioned as adapted to the removal of the several causes from which the affection derives its origin will be sufficient to effect a cure. But,

¹ See 'Cotunnus de Ischiade Nervosâ Commentarius,' cap. xxxv, and Gendrin's 'Histoire Anatomique de l'Inflammation.' The death of a patient during the existence of acute sciatica is so extremely rare, and the pathological effects of simple irritation and congestion—the sole effects, I believe, of most attacks of sciatica—pass off so rapidly, that there are few instances on record in which any lesion of the nerve has been discovered after death. This fact, however, affords no argument against the presumption, which is countenanced by strict physiological reasoning, that when irritation and congestion pass on to inflammation, the ordinary results of such action, namely, the effusion of lymph and serum, will occur at the part affected.

in the latter, the disease is more complex and less tractable. The local congestion can seldom be relieved without the aid of local remedies, and when the stage of simple congestion is passed, and thickening of the sheath of the nerve has occurred, or effusion has commenced within it, the use of topical applications becomes more than ever necessary. The effusion here is not, as in ordinary rheumatism, of secondary importance; it gives rise to pressure upon the nerve, impairs its function, and thus leads to mal-nutrition and wasting of the limb; and if it be not speedily removed, irremediable alteration of structure takes place, and the nerve, hardened by long-continued pressure, is found after death grey and shrunken.

In every case of sciatica, then, the existence or non-existence of effusion within the sheath of the nerve, or of thickening of the sheath itself, is a question of primary importance. If no such mischief exists, the remedies before alluded to, as best calculated to remove the different causes of irritation, will be the most efficient in removing the irritation, with the pain and other symptoms consequent thereon; whereas if effusion or thickening has already taken place, measures will be needed not only to allay existing irritation, and remove its cause, but to promote absorption of the effused fluid, and remedy the local mischief which has occurred.

By what symptoms, then, are we assured of the existence of effusion or of pressure on the nerve? I know not whether the experience of others corresponds with my own observations on this subject, but such signal benefit has been often derived from remedies applied in accordance with the views I am about to enunciate, that I cannot but think them entitled to consideration.

At the commencement of an attack, no *certainty* can be felt as to the existence of pressure on the nerve. But the

probability of its occurrence in the course of the disease is in proportion to the severity of the local symptoms and the intensity of the febrile disturbance, and remedies should be selected and apportioned accordingly. If pain be the prominent feature of the attack, and be unaccompanied by febrile symptoms, it would be right to act as though no thickening or effusion had taken place; whereas, if the pain be attended by fever, it would be prudent to have recourse to measures calculated to check those actions on which the occurrence of local mischief depends. But after the disease has lasted longer and has passed into a chronic form, we have more to guide us to a correct diagnosis. If thickening or effusion be present, there is then not only local pain, but numbness and partial paralysis of the limb as the natural and characteristic results of pressure on the nerve. The nerve being compressed, its function is impaired, and the symptoms alluded to necessarily ensue. Hence, when a patient who is suffering from sciatica complains of *a dull, aching, and benumbing pain in the limb, causing it to feel swollen*, when this sense of numbness and increased bulk has succeeded to pain of greater intensity, accompanied by cramps and startings of the limb; and when, more especially, in addition to these symptoms, there is more or less inability to move the limb,¹—inability arising

¹ In the cases alluded to, it will be found that the patients are unable to move the limb freely, even though the pain be not very severe; they complain that the limb is weak, and feels very heavy, and that *therefore* they cannot move it readily: nay, more, they will often remark, that they have not as much power over it as they previously had, when the pain was much more severe. Though the first activity of the inflammation be subdued, the effused matters which result from that inflammation produce pressure on the nerve, impair its function, and thus lead to loss of power in the limb.

from loss of power, and not as a result of excessive pain,—pressure on the nerve may be inferred, and steps should be taken to effect its removal either by mechanical or medicinal means. In such cases I have repeatedly seen sedatives employed freely and pertinaciously, and various anti-sciatica remedies made use of with the view of effecting a cure; but until the measures alluded to have been adopted, the failure has been so uniform and so complete, that now, whenever symptoms of pressure present themselves, I always resort to that method of treatment which, whatever its *modus operandi*, is entitled to the credit of giving speedy relief.

The measures which prove most efficacious in checking the progress of the local mischief, and promoting absorption of the matters effused, are cupping, leeching, and blistering, combined with the internal administration of mercury, iodide of potassium, and diuretics. The practice of cupping, leeching, and blistering, for the relief of sciatica, was first introduced by Cotunnus, a celebrated Neapolitan physician,¹ under the idea of evacuating an acrid humour from the sheath of the nerve; and the comparative disuse into which it has fallen, has resulted, I believe, from its having been at one time recklessly employed. It has been often resorted to without reference to the question whether the symptoms denoted pressure on the nerve, and the possibility therefore of there being fluid within the sheath of the nerve, or thickening of the sheath itself; and even in cases attended by symptoms indicative of pressure, its good effects have been counteracted by unrestrained movement of the limb, and by the exhibition of stimulant and

¹ 'Cotunnus de Ischiade Nervosâ Commentarius.' 8vo, Viennæ, 1770.

tonic medicines, instead of mercury, iodide of potassium, and other medicines having a tendency to promote the absorption of the effused fluid. Moreover, it was formerly the practice to make use of issues, rather than of blistering; and as their only effect was, as Dr. Seymour remarks, "to add additional distress to unrelieved pain," it is not surprising that discredit should have been thrown on this whole system of treatment. Employed, however, with judicious discrimination, no remedies are capable of affording greater relief. When from the activity of the febrile disturbance, the severity of the pain, and the sense of local heat which attends it, it is probable that the local mischief is of recent date, even if it be not still going on, then cupping or leeching, followed by blisters in the course of the nerve, together with mercurials and purgative and cooling diuretic medicines, should be resorted to early and vigorously.¹ On the other hand, when all febrile symptoms have passed away, when the local mischief is of some standing, and is probably due to causes no longer in existence, then mercurial action should be slowly induced; and blisters should be used in preference to, if not to the exclusion of, cupping and leeching. Indeed, in such cases, vesication is, of all local remedies, the most important, and should be steadily persevered in, the blisters being long and narrow, placed along the track of the nerve, and the blistered surface dressed with mercurial ointment, or sprinkled daily with powdered morphia, to relieve the pain. In some instances, however, morphia applied in this manner appears to aggravate rather than to allay the pain; and when such is the case, its use should be discontinued.

There is one local application of singular efficacy in the

¹ See Case 2, appended to this Chapter.

cure of sciatica connected with pressure upon the nerve; I mean that known as acupuncture. Its virtue is supposed to depend upon the mechanical assistance it affords towards the evacuation of fluid from the sheath of the nerve. Whilst the patient is lying flat on his stomach, six or eight pairs of needles, specially adapted for the purpose, are carefully inserted into the thigh along the course of the sciatic nerve, the object being to puncture the neurilemma, and thus to allow of the escape of any fluid. The operation, if conducted slowly, causes little pain or inconvenience, is altogether devoid of danger, and deserves a trial in obstinate cases. On three occasions I have seen it afford immediate relief, and in one instance the relief was complete and permanent. In many others, however, it has proved unsuccessful: and observation has led me to believe, that the difference in the result has been attributable, in some instances, to imperfect manipulation, whereby the sheath of the nerve has escaped unpunctured, and in some, to the widely differing circumstances under which the operation has been undertaken. If resorted to when no effusion exists, or whilst any trace of inflammation remains, it cannot be useful, and is found not to be so in practice.¹ Indeed, in the latter case, it often acts prejudicially; whereas, if employed when inflammation has subsided, and the nerve is irritated by the unwonted pressure of the effused fluid, it promises speedy and effectual relief.

It is not to be supposed, however, that in all cases of sciatica, or indeed in the major part of them, effusion takes place into the sheath of the nerve. The symptoms by which

¹ In this statement I am borne out by Dr. Elliotson, who says, "I have *never* seen it beneficial in any inflammation or inflammatory pain." ('Medico-Chir. Trans.')

that lesion is accompanied are very striking, and by no means of common occurrence. In most instances of sciatica the pain is obviously unconnected with pressure on the nerve, and arises either from its sympathy with irritation in the intestinal canal or some other distant part of the body, or else from irritation and congestion of the nerve itself consequent on the presence of some morbid matter in the blood. In the former cases the cause of irritation must be removed before any alleviation of pain can be expected; in the latter, counter-irritation and sedatives, combined with such medicines as will neutralise or eliminate the peccant matter, will generally afford relief. But in neither will acupuncture or the remedies already spoken of as calculated to produce absorption, have the slightest influence on the progress of the disease.

Of all internal remedies, those which come most generally and most beneficially to our aid are sedatives, with opium and belladonna at their head. Opium, with the various salts of morphia; belladonna, given internally and applied externally,—henbane, conium and stramonium, the cannabis indica, digitalis, aconite and veratria, these are among the most powerful and most efficient of our allies. In purely neuralgic cases they appear to act as directly curative agents, and require little aid in effecting our object, whilst even in other forms of sciatica they prove most valuable in mitigating the severity of the pain. But in true rheumatic or gouty cases this class of remedies, with the exception, perhaps, of aconite, veratria, and digitalis, appears to be of service only in so far as they tend to diminish nervous irritability, and procure repose. Their value seems to depend upon their power of temporarily assuaging pain and producing sleep, more than upon the exercise of any curative influence. They put a stop to that

irritability which would otherwise render futile all efforts to improve the general health of our patient, and to prevent the further generation of the rheumatic poison ; and, moreover, after the cause of the disease has been got rid of, they enable the patient to endure its painful consequences during the period required for their removal.

Two points, therefore, present themselves for consideration before commencing the administration of this class of medicines ; first, what sedative is likely to prove most beneficial in the particular instance before us ? and, secondly, in what doses will it be needed ? To neither of these questions can a definite answer be returned. The particular sedative to be employed must be regulated in part by the idiosyncrasy of the patient, by the form which the disease has assumed, and by the stage at which it has arrived ; and the quantity of the sedative required can only be measured by the influence exerted over the intensity of the pain. In many cases opium and the salts of morphia afford us all the assistance we desire ; but in some they disagree, or unless administered in very large quantities, are practically inoperative for good. It then becomes expedient to have recourse to some other substances of the same class, and belladonna, stramonium, hyoscyamus, conium, or the cannabis indica, may be employed as occasion requires. Belladonna is especially useful in those cases which are marked by spasmodic twitchings of the muscles, whether manifested by cramp, or by starting of the limb ; and from a quarter to a third, or even two thirds of a grain of the extract may be safely administered twice or three times a day. It is apt, however, to produce dryness of the fauces, together with vertigo, and excessive depression of the vital powers. It should, therefore, be employed with extreme caution, the patient being watched throughout the period of its ad-

ministration in order that, at the least dilatation of the pupil, or at the occurrence of headache with confusion of thought, the use of the remedy may be at once abandoned.

But it is not only from its internal administration that benefit may be obtained in these cases ; the greatest advantage is sometimes derived from its direct application to the seat of pain, both in the form of plaister and in that of fomentation. Not unfrequently an admixture of belladonna and opium may be advantageously prescribed, in the proportion of one drachm of the extract of belladonna to an ounce of laudanum and three drachms of glycerine. A piece of lint wetted with this mixture, and covered with oiled silk, often affords very great relief when placed along the course of the nerve. But in whatever form the remedy is applied, it certainly exerts a remarkable influence over the violence and duration of the spasms ; and the only point to be borne in mind is, that it must not be used, even in the endermic method, without much caution. For if an over-large quantity be employed, or a slight abrasion exist in the cuticle, so that absorption takes place rapidly, it is apt to produce excessive dryness of the fauces, with giddiness, dimness of vision, and other early symptoms of narcotic poisoning.

Stramonium, which was first recommended by the late Dr. Marcet, has been employed largely in the cure of this disease, but not, as far as my experience has gone, with any great success. In some cases, where the symptoms shift from limb to limb, and probably are more strictly nervous than rheumatic, the extract produces a decidedly good effect ; but in no single instance in which the disease has been obstinately stationary, have I known it exercise any control over the violence or duration of the symptoms. Adminis-

tered in doses of from one to two grains, its operation is sometimes remarkably sedative, but more generally its action is uncertain, and is accompanied now and then by excessive dryness of the throat and fauces.

The *hyoscyamus niger* and the *conium maculatum* yield tinctures and extracts possessing sedative qualities well adapted for the relief of this painful disease, but not possessing, as far as I am aware, any obvious superiority over those already described. They are certainly milder and more manageable medicines; and as they are often tolerated by the system when opium and belladonna disagree, they may, and do sometimes, prove serviceable. But in proportion as they are milder than the aforesaid anodynes, so also, in most instances, they are inferior in allaying pain and calming the irritation consequent thereon, and their use, therefore, should be reserved for those cases in which there is something to contra-indicate the employment of those which are more powerful and more efficient.

The *cannabis indica* may be administered in the form either of extract or tincture, but the latter has appeared to me the most speedy and certain in its operation. Given in doses of from twelve to twenty minims, it has often allayed pain and produced repose after most of the ordinary sedatives have failed. Its action, however, is rather capricious. In some instances it proves anodyne and narcotic in the highest degree; in others its action, though marked by relief from pain, is not accompanied by true sleep, but rather by a happy semi-conscious dreamy state; whilst in others, again, it fails entirely in exercising any anodyne influence, and is apt to stimulate and produce an effect resembling the excitement of intoxication. In one patient who by mistake took double the dose I had ordered this effect was most remarkable and distressing. Much caution therefore must be

observed in selecting proper cases for its exhibition, and on no pretext should a full dose be given until the patient's susceptibility to its influence has been thoroughly gauged.

There is one mode of employing morphia and other narcotics which deserves special notice, as enabling us to afford immediate, though too often temporary, relief from suffering. I allude to the injection of a concentrated solution of the drug into the cellular tissue of the body. Formerly this practice was unsatisfactory in its results, in consequence of the clumsiness of the means employed; but, of late years, the improvement in surgical appliances has led to its revival. Indeed, as now employed, it promises to be of great utility. A small glass syringe, with a fine perforated needle-like nozzle, has been manufactured, which renders the injection of the solution easy, and almost painless, whilst at the same time the operator is enabled to calculate to a nicety the amount of fluid injected.¹

At St. George's Hospital this method of treatment has been had recourse to in a considerable number of cases, and with tolerably satisfactory results. If the disease has not been cured through its agency, the pain at least has been relieved, and temporary repose obtained. In every instance, as far as I am aware, morphia has been the drug made use of; and usually its full effect has been produced, and sleep has resulted, within ten minutes from the first commencement of the injection. Nay more, on several occasions, the repetition of the operation on three or four successive days has been followed by complete and permanent cessation of pain.² In many instances, however, this has not

¹ This instrument is manufactured by Messrs. Whicker and Blaise, of St. James's Street, S.W.

² See Case vj appended to this Chapter.

been the case; and my impression is, that although the palliative effects of this treatment may be produced in all cases of sciatica, yet that sedative injections do not exercise a curative effect, except in cases where the pain is of a purely neuralgic character, unconnected with local organic lesion, or with irritation in distant parts of the body. In short, their curative effects are manifest in the same class of cases as are benefited by morphia, applied to a blistered surface as before recommended.¹ The great advantage which the injection of morphia possesses over the application of the drug to a surface denuded of cuticle is the painlessness of its application, and the speediness of its action: the disadvantage is the power and consequent danger of the remedy when thus administered. The full dose is absorbed, and produces its narcotic effect at once; whereas, when taken into the stomach, it is mixed with the various ingesta, finds its way into the veins by slow degrees, and, probably, is in part decomposed in the stomach, and in part carried out of the system by the bowels, without having entered the circulation. Be this as it may, the effects of its injection are so powerful and so speedily produced, that I would earnestly counsel those who have recourse to its assistance, not to inject above a quarter or half a grain in the first instance, and to allow at least six hours to elapse before the operation is repeated. I have never known, nor have I ever heard, of mischief being produced by the remedy when thus cautiously employed, and I have seen it produce effects as satisfactory as they were astounding. The agonised sufferer, who for many days and nights in succession has been unable to close his eyes, or obtain a moment of

¹ At p. 453 of this treatise.

repose, notwithstanding the internal administration of morphia in large doses, has fallen into a calm sleep within a few minutes after the injection has been commenced.

Dr. Alexander Wood, of Edinburgh, recommends¹ that an examination be made to ascertain the spot at which the pain is felt most acutely, and that the sedative be always injected at the painful spot. But our experience at St. George's Hospital is opposed to this plan of proceeding, inasmuch as it appears that the frequent introduction of a perforated needle, and the injection of fluid at the same spot, is apt to lead to inflammation and the formation of abscess—a result which may be avoided, if the needle is introduced on each occasion into a different part of the affected limb. Moreover, there is not any practical reason why the injection should be performed at the most painful spot; for our late house-surgeon, Mr. Hunter, who in the wards of St. George's Hospital, was one of the first in London to carry out the principle of Dr. Wood's practice, ascertained distinctly that it matters not in the slightest degree at what part of the body the injection is effected. The only requisites for obtaining safe and satisfactory results are:—1st, that a proper instrument be employed; 2dly, that a concentrated solution of morphia be used, so that the cellular tissue be not unduly disturbed by the injection of a large quantity of fluid;² 3dly, that the dose be sufficiently large to

¹ See 'Assoc. Journ.,' Aug. 28, 1858.

² The solution usually employed at St. George's contains ten grains of the Acetate of Morphia to one drachm of distilled water; but I prefer a solution of five grains to the drachm, inasmuch as the salt is more readily soluble in this proportion, while the quantity of the liquid which it is requisite to inject is not large enough to excite local irritation.

give relief from suffering, but not large enough to produce toxical effects; and 4thly, that the injection be not repeated at the same spot. With these precautions, the remedy is one which may be resorted to advantageously, whenever the pain of sciatica is very acute and persistent, and resists the action of drugs as ordinarily employed.

Digitalis is a remedy almost unknown to the profession¹ as exercising a curative influence on this disease, but is one, nevertheless, on which much reliance may be placed when the pain is intermittent and purely of a neuralgic character. Sedative and diuretic in its action, it calms the vascular system and excites an increased flow of urine, and thus, though not exercising a narcotic influence, it frequently allays pain and affords repose. But its curative effects are only displayed in the class of cases above alluded to. If the system be charged with the rheumatic, gouty, or syphilitic poison, or if the pain be connected with local inflammation, or with costive bowels and intestinal irritation, *digitalis* will be found of little or no avail. In appropriate cases, however, a grain or a grain and a half of the powdered leaves, or from ten to twenty minims of the tincture, repeated three or four times a day, will be found a very valuable remedy.

The *veratrum album* is another remedy which has been employed in certain forms of sciatica. Closely related to the *colchicum autumnale*, it was recommended by Mr. Moore² as long ago as 1811, as a substitute for the celebrated *Eau Médicinale* of the Chevalier D'Husson. Since that time it

¹ The only notice I can find of the antineuralgic property of *digitalis*, is contained in a brief communication from Mr. Hardwicke, of Rotherham, inserted in the 'Assoc. Med. Journal,' for June 1, 1855.

² See 'Two Letters to Dr. Jones.'

has been administered occasionally in every species of gouty or rheumatic affection in which colchicum is ever used, and has been specially recommended in the neuralgic forms of the disease. Given internally in small and repeated doses, it is said to excite cutaneous exhalation, to increase the action of the kidneys, and to promote secretion from all the mucous surfaces. Of its internal administration, however, I have had a very limited experience, having watched its effects only in some few cases in hospital practice, and, up to the present time, my observation has not led me to form a very favorable estimate of its virtues. Whether owing to imperfection in the preparation employed, or to some other cause which may influence its operation, the effects which have been attributed to it have not ensued. In one or two instances, some improvement has taken place after a dose of from five to fifteen minims of the *Tinctura Veratri*, administered two or three times a day. But more generally the disease has progressed uninfluenced by its action, and it has appeared to me questionable whether the improvement which took place in the cases alluded to was really attributable to the agency of the remedy. I have no experience of the internal administration of the alkaloid veratria, but it has been given internally, by Sir James Bardsley, who says it possesses "no particular claims to the attention of the profession."

The preparations of the *Aconitum Napellus*, whether taken internally or employed externally, are much more efficient remedies in sciatica. I have already¹ pointed out the class of cases in which I have found aconite most serviceable, and I may add that, although the extract has been recommended as a convenient form for its administration, I have invaria-

¹ See p. 425.

bly prescribed the tincture, under the belief that it is not only more certain in its action, but is a safer form for the exhibition of the remedy. During the last eight years, I have tested its value in twenty-five well-marked cases of sciatica, of which nine were characterised by symptoms of *active* disease, and sixteen were examples of the disease in its chronic or subacute form. In one only of the first-named class of cases did it appear to exercise the slightest control over the symptoms, but in five of the chronic cases it afforded almost immediate relief, and the patients recovered perfectly under its continued use, whilst, in several others, decided improvement followed its administration. In no single instance did the slightest inconvenience result from its action, and, therefore, I think we are justified in concluding, not only that it proves a valuable and efficient remedy in many obstinate forms of the disease, but that, if properly administered,¹ and carefully watched, it is as safe and manageable as any other medicine. The risk, however, incurred by the *careless* exhibition of aconite and veratria is on all hands admitted to be so considerable, that I never have recourse to their internal administration, unless I have frequent opportunities of seeing the patient. Externally, they may be employed more frequently, as in this form no risk is incurred, and their beneficial influence is often strikingly displayed. More than once the tincture of the roots, or an acidulated solution of the alcoholic extract,² or alcoholic solutions of the alkaloids aconitine and

¹ See p. 426.

² The alcoholic extract of aconite, to be obtained at Bell's, in Oxford Street, is an excellent preparation. It is far cheaper than pure aconitine; and, in the proportion of from ten to twenty grains to an ounce of spirits, slightly acidulated with sulphuric acid, it is, I believe, almost as efficacious.

veratria, applied by means of a camel's hair brush,¹ or ointments containing aconitina and veratria,² rubbed night and morning along the course of the affected nerve, have afforded relief after every other remedy had been tried in vain; and in no single instance within my experience have they given rise to the slightest inconvenience. Very different results, however, have attended their use in different cases. On no occasion in which they have been tried during the active or inflammatory stage of the disease, have they exercised the slightest influence for good; nor have I seen much benefit result from their employment, so long as the patient has exhibited other symptoms of gout or rheumatism; but in obstinate neuralgic cases, unattended by febrile disturbance, their curative power has been exerted very conspicuously.

There is no class of remedies about the efficacy of which, in the cure of sciatica, a greater difference of opinion exists than about counter-irritants. Dr. Macculloch³ and others consider blisters positively injurious when applied directly to the painful part, whilst a large proportion of the profession

¹ The formulæ I usually employ are for the alcoholic solutions :

Aconitinæ, gr. vj ;	Or, Veratriæ, gr. xx-xxx.
Spir. Rectificati, 3vj ;	
Glycerini, 3ij. Misce.	

These alkaloids should be obtained at Morson's, of Southampton Row, Bloomsbury. Care must be taken not to employ them where the skin is abraded.

² For the ointments :

Aconitinæ, gr. x-xv ;	Or, Veratriæ, gr. xxxvj.
Adipis preparatæ, 3vij ;	
Olei Olivæ, 3j ;	
Olei Bergamotti, ʒi ;	
Olei Santalæ, ʒij. Misce.	

³ ' On Marsh Fever and Neuralgia.'

in this country and on the Continent regard them as among the most valuable of remedial agents. The truth appears to be, that in proportion as the complaint is purely neuralgic arising from irritation at a distance from the seat of pain, and is independent of local congestion, so are blisters and counter-irritants of less and less value, and that their efficacy becomes apparent only when there exists some local mischief which their action modifies or subdues. Whatever may be urged against the indiscriminate use of blisters, there cannot be a doubt, that when, in proper cases, a number of them are applied in succession, whether in strips along the whole course of the nerve, or at those points only which are painful on pressure, as recommended by M. Valleix,¹ the effect produced is often satisfactory. The pain is not only temporarily relieved, but the disease is permanently arrested. The application of blisters, however, is at all times a painful and disagreeable proceeding; and in sciatica at least, though sometimes successful, is at best a very uncertain remedy. Therefore, as we possess many other means of counter-irritation of almost equal efficacy, and far less painful in their application, I rarely have recourse to vesication by the Spanish fly, when my object is simply to produce counter-irritation.

Some persons, however, have not hesitated to employ remedies of a still more painful and heroic nature. Thus, the actual cautery, first recommended by Paulus Ægineta, and employed in several instances by Cotunnus, has been resorted to of late years by several practitioners on the Continent. M. Jobert especially, by his practice at the Hôpital Saint-Louis, has given his sanction to the use of the red-hot iron, after the manner recommended by Dr. Day, in his

¹ 'Traité des Névralgies.'

notes on the so-called thermic treatment. Whatever the relief afforded by its application, the remedy is so painful and so fearfully alarming, that I question whether any circumstances would induce me to recommend it.

Moxas are another form of local application highly spoken of, and not unfrequently used in obstinate cases; but, as M. Valleix¹ very shrewdly remarks, their action is much the same as that of blisters and the actual cautery, but is far more painful than the one, and slower and less efficacious than the other.

One of the readiest and most efficient methods of applying counter-irritation, is by means of a small iron, heated by hot water after the manner described at p. 430. It possesses this advantage over every other local remedy, that its action is immediate, and can be regulated so as to produce slight rubefaction of the part, or to raise the cuticle in vesication. But when it is desired to pass beyond the bounds of mere rubefaction, nothing proves more efficacious than the strong *Liquor Ammoniaë* applied on a pledget of lint or a bit of cotton wool, and covered with a glass. Rubefaction is almost instantly produced, and in a few seconds a blister will be raised. By this means I have known relief afforded on two occasions after several other counter-irritants had failed.

The tartar emetic ointment, an ointment containing croton oil, or the biniodide of mercury in the proportion of two scruples or a drachm to an ounce of lard,² and various stimulating liniments,³ have been employed as counter-irritants in these cases, and have been praised as possessing extraordinary efficacy. But the obstinacy and excessive pain and discomfort of the cutaneous eruption they occasion

¹ Loc. cit., p. 625.

² 'Cases of Tic Doloieux,' by John Scott.

³ See Paper by Mr. Pearson, 'Medico-Chir. Trans., vol. viii.

is more than sufficient to counterbalance their virtues; and as it does not appear from the recorded cases that they possess a curative power superior to many other counter-irritants, I consider their use should not be resorted to except in extreme cases, and when other remedies have failed.

Various other external applications have been tried for the relief of this painful malady. Thus galvanism and electricity have each had their advocates, and by some have been lauded as much too extravagantly as they have been too indiscriminately abused by others. The fact appears to be, that when the disease is dependent on irritation in the bowels, or is sympathetic of mischief occurring elsewhere, they exert no control over its progress, and usually tend to aggravate it, if used before the active symptoms have subsided; whereas when the complaint is of a purely neuralgic nature, and is unconnected with irritation in distant parts of the body, the *continuous* galvanic current is often of essential service, and speedily mitigates the patient's sufferings. In all cases, as soon as the sensibility of the nerve has been subdued, and while the patient's limb is weak and stiff from long-continued inactivity, electricity supplies a stimulus, which assists materially in maintaining the nutrition of the muscles, and restoring their healthy function. But if employed before the pain has subsided, the *interrupted* current very generally aggravates the patient's sufferings.

In like manner, cold has found eager partisans, who have insisted on its value as an external application, especially in the form of ice. I cannot, from experience, speak favorably of its effects when so applied, inasmuch as it has failed in almost every instance in which I have seen it tried; but possibly it may be useful in those cases which are aggra-

vated by warmth, and accompanied by a distressing sense of local heat.

Some persons, however, protest against trusting in the moderately benumbing effect of ice, and recommend the application of a frigorific mixture to the part, capable of reducing the temperature below zero of Fahrenheit's thermometer, and producing complete anæsthesia. The proposer and chief advocate of this plan of treatment is Dr. James Arnott, who has published a series of cases successfully combated after this method, at the Brighton Dispensary.¹ The frigorific mixture employed is two parts of finely pounded ice, and one part of common salt, and this application usually produces complete anæsthesia within five minutes. "If the mixture be properly prepared," he says, "the moment it touches the part it benumbs it; and the patient is hardly sensible of the application until it begins to produce congelation. It is seldom spoken of as a *cold* application; it causes a slight smarting or tingling, and is rather warm than cold." "After the application, when the part first regains its sensibility, there is a similar sensation of smarting, provided means be not adopted to prevent it." But the mode of obviating this discomfort, "is to keep the heat of the part for some time under its natural degree; and the application of a bladder containing cold water is the best mode of effecting this."²

In cases of sciatica, Dr. Arnott admits, congelation is not so striking or so immediate in its effects as in lumbago, "which usually yields to one application;" but, he says, it is not the less successful, though more than one application

¹ 'On Neuralgic, Rheumatic, and other painful Affections,' by James Arnott, M.D.

² Loc. cit.

may be required. The mischievous reaction which is found to follow the employment of ice as a benumbing agent, is not observed after the use of the frigorific mixture of ice and salt, for "the greater energy of this congelation at once subdues all opposition. It permanently depresses the vascular and nervous energies, and at the same time probably modifies the local actions," and, "although sensibility soon returns upon the restoration of the natural temperature, it returns in its natural or normal condition."

My own experience does not enable me to pronounce a positive opinion upon this plan of treatment, for I have witnessed its effects in only three instances. In one case the frigorific mixture was had recourse to during the acute or inflammatory stage of the complaint, and the pain was lulled and the inflammatory action subdued. The patient, however, was taking medicine internally at the same time, and it is difficult, therefore, to estimate precisely the influence exerted by the external application. In the other two cases, which were instances of chronic painful sciatica, with a sense of heavy weight and numbness of the limb, following an acute inflammatory attack, the mixture, though productive of momentary relief—the direct result probably of anæsthesia—had no permanent effect on the progress of the disease. Judging, therefore, from what I have myself witnessed, as also from the known effects of benumbing cold, I have come to the conclusion that, although this application may possibly be useful in purely painful affections of the nerve, in cases of congestion or commencing inflammation, and in those cases again which, whatever their cause, are aggravated by warmth and accompanied by a distressing sense of local heat, it must necessarily fail in every instance in which the pain arises from irritation in the alimentary canal or other distant part, or in which inflammation has

gone on to effusion or to thickening of the sheath of the nerve; for however much cold may reduce inflammation and deaden pain arising from local causes, it cannot get rid of the fluid poured out as the product of inflammatory action, nor can it subdue pain attributable to the persistent agency of distant causes. The instances, however, cited by Dr. Arnott, seem to show that the powerful influence of this agent may be beneficially employed more frequently than might, *à priori*, be expected.

Firm and continued pressure, as with a ligature or the tourniquet, is another expedient which has been adopted for the relief of the agonising pain in certain formidable examples of the disease. Applied for several successive hours, it is said to have checked the violence of the paroxysm, and to have prevented its occurrence in intermittent cases. But it utterly failed in affording relief in the only instance in which I have had recourse to its assistance, and I am unable, therefore, to do more than record the fact that its virtues when thus employed have been highly eulogised.

Terebinthinate and camphor liniments, and various stimulating oils, especially the oil of horse-chesnuts, have been lauded as components of anti-sciatica embrocations, and, in some few instances, have been productive of temporary relief, through their agency as counter-irritants. In my hands, however, anodyne applications have been much more uniformly successful. A strip of flannel, soaked in a mixture containing equal parts of laudanum, Hoffinan's æther, and glycerine, to every ounce of which twenty grains of the extract of belladonna have been added, placed along the course of the nerve, and then covered with oiled silk so as to prevent evaporation, has often been the means of mitigating the severity of a paroxysm in a marvellously short space of time, and, in some few instances, has arrested the

disease. Chloroform, employed in the same manner, has also proved extremely serviceable.

Nothing, however, proves more generally efficacious than sulphur applied externally. Whatever its mode of operation, the fact remains that, employed in this manner, it often subdues pain which has persisted in spite of all other remedies. In many parts of England the sulphur ointment of the Pharmacopœia is a favorite remedy amongst the poor for the cure of rheumatism, whether affecting the joints or other parts of the body, and brief notices of its virtue when thus employed are to be found sparsely scattered through our periodical literature. But in no recognised treatise, with which I am acquainted, do I find the slightest notice of the curative action of sulphur applied externally;¹ and I am indebted to one of my hospital patients for directing my attention to the subject. He was a man forty-three years of age, who had been afflicted with sciatica in a severe form above five months. He had undergone a long course of medical treatment before he applied at the hospital, but without obtaining the least mitigation of suffering, and I had already tried several remedies with little success, when a friend induced him to put sulphur in his boots, and otherwise apply the remedy externally. In four days he was much relieved, and in less than a fortnight had recovered perfectly. Since that time I have used it in

¹ Since the above was written, my attention has been directed by Dr. Nicholson, of Redditch, to a special treatise on Sulphur in the cure of rheumatism, published by Mr. R. W. Wallace, so long ago as 1820, in which he recommends local sulphur fumigation, and the subsequent wrapping of the part in flannel. Moreover, in the 'Lancet' for March 7, 1835, vol. 1, p. 810, there is an interesting notice as to the curative effects of its external application, by Mr. George Tucker.

seventeen chronic, non-inflammatory cases ; and in six only did it fail in giving relief. In four cases the relief was complete and permanent, and occurred within ten days after its application was commenced : in three others considerable alleviation of pain was obtained, but a complete cure was not effected, and in the remaining four the relief was only partial and transient. Several of these cases, however, occurred amongst my out-patients at St. George's Hospital, and it is questionable whether the remedy was tried fairly and perseveringly.

The mode in which I usually employ it is to sprinkle thickly with precipitated sulphur a piece of new flannel, in which the whole of the affected limb is to be encased, from the foot upwards. This should be kept in its place by a bandage, and when expense is not of importance, the whole limb so bandaged should be covered with oiled silk or gutta percha, which has the effect not only of increasing the warmth, and confining the vapour of the sulphur, but also of obviating the disagreeable odour consequent on the application of the remedy. This bandage should be kept applied day and night. Contrary to what might be expected *à priori*, absorption of the sulphur takes place rapidly, and the breath, the urine, the secretions from the bowels, and the cutaneous exhalation, unmistakeably attest its presence in the system. And this, probably, explains the mystery of its action in mitigating or subduing the pain of sciatica. For not only does the remedy find its way into the circulation as readily, if not more so, than when administered by the mouth, but it is applied to the affected part more directly, more constantly, and in larger quantities than it can be under any other mode of administration. The only exception to this is when the skin is dry and inactive, in which case the sulphur does not disappear, the excretions

give no token of its absorption into the system, and the remedy fails in affording relief, unless means are taken to stimulate cutaneous action.

Whatever the precise influence it exerts in sciatica there cannot be a doubt that its beneficial effects are most strikingly displayed in chronic cases unattended by any symptoms of inflammation—in cases in which the limb feels cold, and pain is felt only on exertion. If any symptoms of inflammation are present, and if the pain is excessive even when the limb is at rest, then, according to my observation, sulphur is seldom of any benefit, and in some instances may possibly aggravate the pain. And if its action be to stimulate the capillary circulation, as has been suggested by Sunderlin and others of the German school, it is not difficult to conceive how its influence may prove beneficial in certain instances, and no less prejudicial in others.

I have hitherto made no mention of baths as curative agents in this form of disease, nor is it necessary to do more than briefly allude to them. When the cause of the disease has passed away, and only pain remains, the effect of former mischief, baths, if not wholly inoperative for good, are at all events inadequate to effect a cure. So, also, when the pain is attributable to gastric or intestinal irritation, baths, if serviceable, prove so by promoting free cutaneous action, and thus improving the general health, more than by any direct local influence they exert. But when the origin of the mischief is rheumatic, and the blood is charged with the morbid element, warm baths, and vapour and hot-air baths, may be as useful as they are in other forms of rheumatism. In some chronic cases, shower baths prove excellent tonics, and go far towards effecting the eradication of the disorder; and cold bathing, more especially in salt water, is an excellent adjuvant to medicine, in imparting

vigour to the system, and enabling it to throw off the remnants of the malady. In Russia the occasional use of a hot bath or a vapour bath, immediately followed by a shower bath, or an ordinary water bath, cold or tepid, according to circumstances, has a great repute as a powerful restorative of a healthy cutaneous circulation, and this, together with certain other forms of rational hydropathy, in which strict attention to the daily routine of life, rational habits, rational diet, rational exercise, and rational repose, play an important part in the restoration of health, will often enable us to effect a cure, even when our best-directed efforts, when unassisted by these potent auxiliaries, have proved quite unavailing.

But if vapour and other artificial baths are sometimes of service in this form of complaint, much more so are the natural mineral waters. The springs of Bath, Harrogate, and Buxton have long enjoyed a well-merited reputation for the cure of certain forms of this malady, and many of the Continental spas are resorted to for the same purpose. The waters of Wood-Hall, in Lincolnshire, which contain iodine and bromine in large quantities, are rising rapidly in estimation, and in more than one instance I have known them afford relief which had proved unattainable by other means. But before recommending a patient to resort to any particular watering place, it behoves us to consider well the history of his case, the precise nature of the symptoms, and his constitutional peculiarities, for the various waters differ so greatly in their action, that if we fail to select the spring adapted to his particular case, he will probably derive little benefit from their operation.

The preceding observations apply only to baths in which the whole body is immersed, but it must not be forgotten that local baths of various descriptions add greatly to the

effect of other treatment, particularly when the complaint is of rheumatic origin. Even in the acute stage, warm fomentations, constantly applied, afford much ease and comfort; and their efficacy may be increased by the addition of an alkaline and opiate solution, as recommended in a previous chapter. When the disease has assumed a chronic form, douches of hot, cold, or tepid water, or douches of vapour, simple or medicated, repeatedly applied, are often of the greatest service. They neither distress nor exhaust the patient, but they stimulate and soothe the affected parts, and assist in the re-establishment of their healthy functions. Indeed, one of the most useful local applications is the vapour douche applied to a part which has been smeared or painted with some sedative extract or tincture mixed with glycerine. It combines the influence of the sedative and the vapour douche more effectually, I believe, than does the application of medicated vapour.

On the same principle on which shower baths have been found beneficial, various tonic medicines, such as quina, iron, zinc, and arsenic, have proved serviceable in patients of broken health or weakly constitution. But they are not all equally useful in every case. Quina appears to be the most efficient remedy, in proportion as the appetite has been bad, and the attacks more or less distinctly intermittent, whilst iron proves most useful in pallid or anæmic persons with a weak pulse and a feeble circulation; and zinc, when the patient is of an irritable constitution, and the attacks are characterised by much spasmodic action. Arsenic is most serviceable to those in whom the attacks have been paroxysmal, and accompanied by symptoms of a nervous character. Seldom, however, will either of these medicines prove really efficient, unless preceded by the administration of remedies directed against the state of system out of which the pri-

many mischief has arisen. If the attack is of rheumatic origin, alkalies, colchicum, and anodynes, are just as necessary as in the more active forms of the disease, though, of course, in doses proportionate to the severity of the symptoms; and so are vegetable bitters and alteratives, to restore a healthy state of assimilation. Without the previous administration of medicines such as these, to subdue present irritation, and provide against the further generation of the poison, quina and arsenic may be given in vain; and, in like manner, anodynes with colchicum, and other anti-rheumatic medicines, may be ineffectual in affording *permanent* relief, unless followed by a course of tonics.

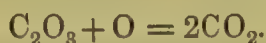
There is one fact in regard to sciatica and other forms of neuralgic rheumatism, which must not be allowed to pass without notice, the more so as it has a direct practical bearing on the treatment of many forms of this disease. I allude to the presence of a large quantity of oxalate of lime in the urine. Case after case has come under my notice, in which iodide of potassium, alkalies, colchicum, guaiacum, warm baths, embrocations, and other expedients, have been fruitlessly employed before the patient came under my care, and in which microscopical examination of the urine has revealed to me at once the class of remedies necessary to relieve the patient's sufferings. The cases in which oxaluria occurs are usually characterised by nervous irritability and languor, rather than by fever or arterial excitement, and the urine is often left unexamined because it is clear, bright, and plentiful. Viewed, however, in considerable quantity, it will usually present a peculiar greenish tint, and if it be allowed to remain for the space of two or three hours, in a funnel-shaped glass, the deposit which occurs will be found to contain the octohedral crystals of oxalate of lime. In such cases the internal administration of nitro-muriatic acid, in

full doses (mvi-x) aided by an occasional brisk purgative, the cold shower-bath, or a cold douche down the spine, followed by active manual friction, proves the most effectual, I might almost say, the only effectual, mode of getting rid of the complaint. In no case of disease with which I am acquainted, does improvment follow more rapidly after the commencement of treatment. But the effects of the treatment are most striking when it can be combined with change of air and scene. For this is a form of complaint which usually occurs in persons who lead a sedentary life and are closely engaged in study or some other active mental exercise; and perfect relaxation of mind is almost as useful in such cases as the most potent drugs of our Pharmacopœia. But as medicine, without due rest and mental quietude, is of less avail than when assisted by such auxiliaries, so change of scene and mental recreation rarely prove effectual in removing the complaint without the aid of proper remedies. Therefore, whenever a case occurs which presents the conditions referred to, I make a point of recommending change of air, as soon as I have satisfied myself that the course of treatment pursued is proving beneficial to the patient. And when this plan is adopted, a few weeks' attention to the general health, combined with judicious medical treatment, usually succeeds in eradicating the disorder.

If it be asked how nitro-muriatic acid operates in getting rid of the oxalate of lime, and with it, as it does, of the nervous pains, I answer, that we are just as ignorant of the matter as on the first day when chemistry became a science. But to those who show themselves unwilling to accept or act upon an ascertained fact unless it can be supported by theory, I would reply by suggesting, with Dr. Headland,¹

¹ See Headland 'On the Action of Medicines,' pp. 186-9.

that the action of nitro-muriatic acid in checking the tendency to oxaluria may be by serving as an oxidizing agent, and favouring the conversion of oxalic acid into carbonic acid. Thus :



Be this as it may, the important practical fact remains, that when sciatica is accompanied by the abnormal condition of the urine before referred to, the remedies recommended have the effect of removing that condition, and with it the wearing pain down the sciatic nerve.

I have hitherto spoken only of affection of the great sciatic nerve, because it affords some of the best examples of this particular form of rheumatism. But not unfrequently the brachial and the facial nerves are also implicated, and there are some points relating to their affection which require a passing notice. It must always be remembered that here, as in sciatica, the complaint may be rheumatic, or may be referable to other causes. It may have arisen from long exposure to cold or draughts, or it may be connected with agencies of a totally different nature. The pain in the arm may be sympathetic of mischief in the heart or in the brain, and the pain in the face of disease in the antrum, or in the teeth and their sockets, of disorder of the stomach and intestinal canal, or of the irritation connected with a gravid uterus. Many persons suffer invariably from face-ache or toothache during pregnancy, as also when their stomach or bowels are out of order. Therefore, when summoned to the relief of a patient suffering from either of these forms of disease, the first point to be ascertained is that the disease is really what it appears to be, a primary affection of the nerves and their fibrous sheaths, and not pain symptomatic of distant local mischief. This being determined, the same general plan of treatment should be

pursued as has been already recommended for the cure of sciatica. When the affection is purely neuralgic, quina in full doses; the sulphate of zinc, pushed until two scruples or a drachm are taken daily; the sesquicarbonate of iron; or arsenic, each of which may be combined, if necessary, with aconite, and aided in their action by a sedative at night, and an occasional morning laxative, are usually the most efficient internal remedies, and their salutary effects may be greatly promoted by external anodyne applications. Those already mentioned are often quite effectual for the relief of the pain, but when they fail, chloroform or chloric æther, applied in the palm of the hand to the seat of pain, sometimes exerts a magically soothing influence, whilst at others the external application of hydrocyanic acid is attended with the happiest results.¹ When the brachial nerve is the part at fault, the various remedies which prove useful in sciatica may be tried with a reasonable prospect of success, but, in this form of the complaint, greater benefit is derived from a solution of aconitine, or from the use of the aconitine or veratria ointment, than from any other external application.

The following cases will serve to illustrate some of the points already mentioned relative to treatment.

Case 1.—On the 10th of January, 1853, I was asked to see Colonel —, æt. 57, who had been a martyr to sciatica in the right leg nearly ten months. There was no gout in his family, and he had never experienced an attack either of gout or rheumatism; but some years ago, whilst in South America, he had intermittent fever, followed by violent “tic” in the face. The pain on the present occasion came

¹ A lotion composed of half an ounce of the Pharmacopœia acid, in combination with two drachms of rose water, and two drachms of glycerine, painted on the seat of pain by means of a camel’s hair brush, is an application which I have often found useful.

on suddenly, soon after a long fatiguing ride in a cold easterly wind. He was not aware of having ricked or hurt himself, and could not account for the invasion of the disease. Before he applied to me, he had taken alkalies, colchicum, iodide of potassium, sulphur, guaiacum, and various other internal remedies; had applied blisters and embrocations to the leg, and had been to Bath and Aix-la-Chapelle without relief.

When I first saw him, he was thin and sallow, and was looking much worn in consequence of long-continued want of rest. He described the pain as being ordinarily of a dull aching character; but it was aggravated in paroxysms, which generally occurred about twice a-week, and often lasted several hours, during which the whole limb quivered with pain. He was easy whilst lying quiet, but the least attempt at motion invariably induced acute pain in the hip, thigh, and leg. The acts of coughing, sneezing, or laughing were also productive of an attack. His tongue was clean and moist; bowels usually regular; urine clear, but containing an unusual quantity of oxalate of lime crystals; pulse 84, soft.

As his history and present symptoms seemed to negative the idea of his being truly rheumatic, and appeared to point to neuralgia, connected probably with some obscure miasmatic influence, as the cause of his suffering, I prescribed the following remedies, viz. :

Tincturæ Aconiti, ℥vj ;
 Quinæ Disulphatis, gr. iv ;
 Acidi Sulphurici Diluti, ʒss ;
 Syrupi, ʒiss ;
 Decocti Cinchonæ, ʒx. M. ft. Haustus ter die sumendus.

Extracti Belladonnæ, gr. j ;
 Pil. Saponis Comp., gr. viij. M. ft. Pilulæ duæ omni nocte sumendæ.

Liquoris Opii Sedativi, ʒvi ;

Extracti Belladonnæ, ʒi ;

Tincturæ Aconiti, ʒv ;

Glycerini, ʒiv. M. ft. Lotio parti affectæ more exposto applicanda.

A piece of lint wetted with the above lotion, and covered with oiled silk, was applied along the course of the sciatic nerve ; and the bowels were regulated by means of castor oil and an occasional enema of warm water. As the digestive organs were not out of order, a generous diet was allowed. At the expiration of three days the pain was much easier ; he was able to sleep several hours uninterruptedly during the night, and could walk across the room by the aid of a stick, without inducing any increase of suffering. On the 19th the pain had so far subsided, that I deemed it expedient to omit the pill at night, and to trust exclusively to the effect of the mixture and the sedative lotion. The omission did not prevent his sleeping ; on the contrary, he slept well, and felt more comfortable next day. Indeed, his progress towards recovery was steady and rapid. On the 25th the lotion was omitted, and the mixture was ordered to be taken only twice a-day. On the 30th a simple quinine draught, with half a drachm of sulphate of magnesia, was substituted for the bark and aconite ; and on the 8th of February, or within a month from the commencement of treatment, he felt perfectly well, and all medicines were omitted.

Case II.—Elizabeth Beasley, æt. 46, was admitted into the Holland Ward of St. George's Hospital on the 1st of February, 1853, suffering from acute sciatica affecting both legs. The attack, which came on suddenly a week before her admission into the hospital, had been preceded for six days by wandering pains in the limbs, without redness or swelling of the joints, and had been accompanied from the

first by cramps and startings of the limbs. She had never before experienced an attack.

On admission, the pain was of the most agonising description. Commencing in the lower part of the back, it shot through both hips, and down the back of both legs as far as the ankles, giving rise, at brief intervals, to violent cramp and starting of the limb, with an aggravation of her previous suffering. The act of coughing or sneezing, and the least attempt at motion in bed, induced a paroxysm of this description; and so also did pressure, however slight, in the course of the nerve. She was utterly unable to sleep; her countenance was anxious, and portrayed the agony she was enduring; the face was flushed; her skin was hot, and bathed in perspiration; tongue exceedingly furred; bowels open; urine scanty, high-coloured, and loaded with lithates. Pulse 120. Catamenia regular.

As the history of the case afforded evidence of the existence of rheumatism, it seemed probable that the extreme violence of the pain might be attributable to rheumatic inflammation of the sheath of the nerve; and I was, therefore, induced not only to administer alkalies and other anti-rheumatic medicines, but to have recourse to calomel and opium. The following is the form in which the remedies were prescribed:

Hydrargyri Chloridi, gr. iij;
Opii, gr. i. M. ft. Pilula ter die sumenda.

Haustus Sennæ cras mane.

Potassii Iodidi, gr. v;
Vini Colchici, ℥xx;
Potassæ Bicarbonatis;
Potassæ Acetatis, āā ʒij;
Haustus Potassæ Citratis, ʒiiss. M. ft. Haustus 6tâ
quâque horâ sumendus.

Broth diet.

On the 5th, the urine had become clear, and had increased in quantity, the violent cramps and startings of the limbs had ceased, and the pain was easier. She complained, however, of a sense of weight and numbness of the affected limb which she had not before experienced. The remedies were continued as before. On the 8th there was still further improvement, and the pill was ordered to be taken only twice a day. On the 10th, as the improvement continued, it was given only once daily. On the 12th, there was no longer any numbness or sense of increased weight in the limb, and therefore the pill was discontinued. On the 18th, as little or no pain remained, and she was somewhat weak, it was determined to omit the draught, and administer bark combined, by way of precaution, with liquor potassæ and iodide of potassium. This she continued to take until March 2d, when, as there was no return of pain, and she felt quite strong, she was permitted to return home.

Case III.—Thomas Lloyd, æt. 29, was admitted into the York Ward of St. George's Hospital on April 8th, 1857. A clerk by occupation, he had not been exposed to any external agencies likely to produce an attack of sciatica, but he had been "out of sorts" for some months, and latterly *had experienced wandering rheumatic pains*. On the 28th of March, he had been seized with shivering, followed by pain shooting down the back of both thighs and legs as far as the ankles, and, in spite of treatment, this had gradually increased up to the date of his admission.

When I first saw him, he was suffering acutely from sciatica in both legs, especially the right. The pain was excruciating, even when he was at rest, and any attempt at

motion gave rise to involuntary starting of the limb, and occasionally to cramp in the muscles of the calf. His skin was hot and perspiring; tongue coated and white; saliva acid; bowels reported regular; urine scanty, turbid, and acid. Pulse 96, small and irritable.

As the history of the case pointed clearly to true rheumatism as the cause of the seizure, I determined to administer alkaline remedies in the following mannner, viz. :—

Potassæ Acetatis;
 Potassæ Bicarbonatis, āā ʒij;
 Misturæ Guaiaci, ʒiss. M. ft. Haustus ter die
 sumendus.

At the same time, with the view of testing the efficacy of sulphur externally, I had it applied to the right leg only, in the manner recommended at page 468 of this treatise. His diet was restricted to beef tea.

By the 11th, the pain was easier in the left leg, and he had lost all pain in the right leg, to which the sulphur had been applied. The tongue had become clean; the bowels were acting regularly; and the urine was clear, but still acid. The medicine was continued as before, but he was allowed fish for dinner.

On the 15th, he no longer complained of pain, and asked leave to get up and dress. This was permitted, and he was ordered “ordinary diet,” and to take the medicine only twice a day.

On the 19th, slight rheumatic swelling of the ankles took place, but there was no recurrence of sciatica. The diet was changed again to fish and beef tea, and the medicine was continued.

On the 23d the swelling of the ankles had disappeared, and it was judged safe to recur to ordinary diet. From this time he gained strength daily: he had no recurrence of

rheumatism or sciatica, and was therefore permitted to leave the hospital on the 30th.

Case IV.—John Collins, æt. 28, was admitted into the King's Ward of St. George's Hospital on December 16th, 1857, suffering from sciatica of the left side. The attack commenced ten weeks previously, coincidently with pain and swelling of the left foot and knee, and of both hands. The swelling of the joints soon subsided under treatment, but the sciatica had continued unabated. During the first violence of the attack, he had sweated profusely.

On admission, his complexion was pale and sallow; the skin cool; tongue coated; bowels very costive; pulse 84, weak; urine clear, but acid. Appetite good. The pain down the sciatic nerve was of a dull, wearing character, and did not amount to acute suffering, except when he attempted to sit or stand. His easy posture was lying on his back in bed, with the knee slightly flexed. There was not any tenderness of the nerve on pressure.

As the symptoms manifestly originated in true rheumatism, and their persistence was probably connected with irritation of the sacral plexus of nerves consequent on long-continued constipation, the following medicines were prescribed, viz. :—

Olei Tiglii, ʒi;

Pilulæ Colocynth. c. Calomelanæ, gr. v. M. ft. Pilula
statim sumenda.

Pulveris Guaiaci;

Sulphuris Loti;

Magnesiæ Carbonatis;

Sodæ Bicarbonatis, āā ʒss. M. ft. Pulvis ter die
sumendus.

The bowels acted fully during the 17th and 18th, and

on the following day the pain down the sciatic nerve had ceased, and his water was slightly alkaline. I therefore ordered the powder to be repeated every morning only, and prescribed—

Haustûs Cinchonæ, ʒiiss; ter die.

From this time he progressed favourably: there was no return of pain; and he left the hospital on the 25th.

Case v.—Georgiana King, æt. 58, was admitted into the Queen's Ward at St. George's Hospital on May 5th, 1858, suffering from sciatica of the left side, of four months' duration. The pain, which was severe, had not intermitted in the slightest degree since the commencement of the attack; it was aggravated by motion, and was accompanied by occasional cramp and starting of the leg. She had not experienced pain in other parts of the body during present illness, neither had she been previously subject to rheumatism, and she had never before undergone an attack of sciatica. Blisters and liniments had been applied externally, and various internal remedies had been administered during the two months preceding her admission to St. George's Hospital, but nothing had afforded the slightest relief.

On admission, the aspect was healthy; the skin warm; tongue clean and moist; bowels costive; urine clear and light-coloured, and free from crystals of oxalate of lime. Pulse 108, irritable, and rather weak. The appetite was good. The catamenia had been absent since the age of thirty-four. The pain extended from the left hip down to the ankle; but no specially tender spot could be discovered in the course of the nerve.

As the bowels were confined, and as the condition of the

urine seemed to point to neuralgia, rather than to true rheumatism, as the cause of the pain, I ordered a large turpentine enema to be administered at once, with the view of thoroughly emptying the lower bowel ; and prescribed the following draught, viz. :—

Tincturæ Aconiti, mvj ;
Haustûs Cinchonæ, ziss . M. ft. Haustus sextis horis
sumendus.

At the same time, as her tongue was clean, and her digestive organs appeared to be in good order, I gave her the *ordinary diet* of the hospital.

On the 7th, as the bowels had not acted freely, it was judged expedient to administer ten grains of colocynth and calomel.

The pills were repeated on the 11th, and again on the 14th; but, with this exception, no alteration was made in the treatment throughout the period of her residence in the hospital. From the first, it was manifest that the medicine was exercising a beneficial influence, for the severity of the pain subsided within a few days. On the 18th all pain had ceased ; and on the 19th she was permitted to leave the hospital.

Case vi.—Henry South, a labourer, æt. 29, was admitted into the King's Ward of St. George's Hospital, on the 29th of September, 1858, suffering from sciatica of the left side. The pain, which was of six months' duration, extended from the hip down the thigh and leg. It was of a dull, wearing character, but was much increased by motion, and by every act of straining, as in coughing, sneezing, and the like. For some length of time he had not had a good night's rest ; but his bowels were regular, and the various

bodily functions were regularly performed. Warm baths, galvanism, and various internal remedies, were had recourse to, without relief; and on the 30th of October, as no benefit had resulted, all medicines were omitted.

On the 3d of November, Mr. Charles Hunter, who was then house surgeon, introduced a finely-perforated needle into the cellular tissue at the lower border of the left buttock, and injected three quarters of a grain of the acetate of morphia. Within a few minutes the patient became drowsy; and at the expiration of three quarters of an hour he fell asleep. The next morning, his tongue was rather dry, and he vomited once; but his pain was easier, and he said he had passed a quieter night than he had done for some months. In the evening of the 4th, the injection was repeated, the solution being introduced into the cellular tissue of the right arm. He went to sleep immediately the operation was concluded, and slept soundly for five hours. When he awoke, he had less pain than on the previous day. From this time his progress towards recovery was steady and rapid. Each night the injection was repeated, and day by day the pain decreased. In short, five injections were found sufficient to subdue the pain; and he left the hospital on the 10th, free from uneasiness, and able to walk comfortably. No sickness or discomfort was produced, except after the first injection.

